



HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL
TRAINING AT THE UNIVERSITY OF HELSINKI 2005–2010

RC-Specific Evaluation of CNC – Cognitive Neuroscience Cluster

Seppo Saari & Antti Moilanen (Eds.)



Evaluation Panel: Social Sciences

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Title: International Evaluation of Research and Doctoral Training at the University of Helsinki 2005–2010 : RC-Specific Evaluation of CNC – Cognitive Neuroscience Cluster	Type of publication: Evaluations
Summary: Researcher Community (RC) was a new concept of the participating unit in the evaluation. Participation in the evaluation was voluntary and the RCs had to choose one of the five characteristic categories to participate. Evaluation of the Researcher Community was based on the answers to the evaluation questions. In addition a list of publications and other activities were provided by the TUHAT system. The CWTS/Leiden University conducted analyses for 80 RCs and the Helsinki University Library for 66 RCs. Panellists, 49 and two special experts in five panels evaluated all the evaluation material as a whole and discussed the feedback for RC-specific reports in the panel meetings in Helsinki. The main part of this report is consisted of the feedback which is published as such in the report. Chapters in the report: 1. Background for the evaluation 2. Evaluation feedback for the Researcher Community 3. List of publications 4. List of activities 5. Bibliometric analyses The level of the RCs' success can be concluded from the written feedback together with the numeric evaluation of four evaluation questions and the category fitness. More conclusions of the success can be drawn based on the University-level report.	
RC-specific information:	
Main scientific field of research: Social Sciences	RC-specific keywords: cognitive neuroscience, speech perception, music perception, attention, memory, learning
Participation category: 1. Research of the participating community represents the international cutting edge in its field	
RC's responsible person: Kujala, Teija	
Keywords: Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community	

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Foreword

The evaluation of research and doctoral training is being carried out in the years 2010–2012 and will end in 2012. The steering group appointed by the Rector in January 2010 set the conditions for participating in the evaluation and prepared the Terms of Reference to present the evaluation procedure and criteria. The publications and other scientific activities included in the evaluation covered the years 2005–2010.

The participating unit in the evaluation was defined as a Researcher Community (RC). To obtain a critical mass with university-level impact, the number of members was set to range from 20 to 120. The RCs were required to contain researchers in all stages of their research career, from doctoral students to principal investigators (PIs). All in all, 136 Researcher Communities participated in this voluntary evaluation, 5857 persons in total, of whom 1131 were principal investigators. PIs were allowed to participate in two communities in certain cases, and 72 of them used this opportunity and participated in two RCs.

This evaluation enabled researchers to define RCs from the “bottom up” and across disciplines. The aim of the evaluation was not to assess individual performance but a community with shared aims and researcher-training activities. The RCs were able to choose among five different categories that characterised the status and main aims of their research. The steering group considered the process of applying to participate in the evaluation to be important, which led to the establishment of these categories. In addition, providing a service for the RCs to enable them to benchmark their research at the global level was a main goal of the evaluation.

The data for the evaluation consisted of the RCs’ answers to evaluation questions on supplied e-forms and a compilation extracted from the TUHAT – Research Information System (RIS) on 12 April 2011. The compilation covered scientific and other publications as well as certain areas of scientific activities. During the process, the RCs were asked to check the list of publications and other scientific activities and make corrections if needed. These TUHAT compilations are public and available on the evaluation project sites of each RC in the TUHAT-RIS.

In addition to the e-form and TUHAT compilation, University of Leiden (CWTS) carried out bibliometric analyses from the articles included in the Web of Science (WoS). This was done on University and RC levels. In cases where the publication forums of the RC were clearly not represented by the WoS data, the Library of the University of Helsinki conducted a separate analysis of the publications. This was done for 66 RCs representing the humanities and social sciences.

The evaluation office also carried out an enquiry targeted to the supervisors and PhD candidates about the organisation of doctoral studies at the University of Helsinki. This and other documents describing the University and the Finnish higher education system were provided to the panellists.

The panel feedback for each RC is unique and presented as an entity. The first collective evaluation reports available for the whole panel were prepared in July–August 2011. The reports were accessible to all panel members via the electronic evaluation platform in August. Scoring from 1 to 5 was used to complement written feedback in association with evaluation questions 1–4 (scientific focus and quality, doctoral training, societal impact, cooperation) and in addition to the category evaluating the fitness for participation in the evaluation. Panellists used the international level as a point of comparison in the evaluation. Scoring was not expected to go along with a preset deviation.

Each of the draft reports were discussed and dealt with by the panel in meetings in Helsinki (from 11 September to 13 September or from 18 September to 20 September 2011). In these meetings the panels also examined the deviations among the scores and finalised the draft reports together.

The current RC-specific report deals shortly with the background of the evaluation and the terms of participation. The main evaluation feedback is provided in the evaluation report, organised according to the evaluation questions. The original material provided by the RCs for the panellists has been attached to these documents.

On behalf of the evaluation steering group and office, I sincerely wish to thank you warmly for your participation in this evaluation. The effort you made in submitting the data to TUHAT-RIS is gratefully acknowledged by the University. We wish that you find this panel feedback useful in many ways. The bibliometric profiles may open a new view on your publication forums and provide a perspective for discussion on your choice of forums. We especially hope that this evaluation report will help you in setting the future goals of your research.

Johanna Björkroth
Vice-Rector
Chair of the Steering Group of the Evaluation

Steering Group of the evaluation

Steering group, nominated by the Rector of the University, was responsible for the planning of the evaluation and its implementation having altogether 22 meetings between February 2010 and March 2012.

Chair

Vice-Rector, professor **Johanna Björkroth**

Vice-Chair

Professor **Marja Airaksinen**

Chief Information Specialist, Dr **Maria Forsman**

Professor **Arto Mustajoki**

University Lecturer, Dr **Kirsi Pyhältö**

Director of Strategic Planning and Development, Dr **Ossi Tuomi**

Doctoral candidate, MSocSc **Jussi Vauhkonen**

Panel members

CHAIR

Professor Hebe Vessuri

Social anthropology

Venezuelan Institute of Scientific Research, Venezuela

VICE-CHAIR

Professor Christine Heim

Psychology, neurobiology of early-life stress, depression, anxiety, functional somatic disorders

Charité University Medicine Berlin, Germany

Professor Allen Ketcham

Ethics and social philosophy, applied Social philosophy, ethics of business

Texas A&M University – Kingsville, USA

Professor Erno Lehtinen

Education, educational reform

University of Turku, Finland

Professor Enzo Mingione

Urban sociology

University of Milan - Bicocca, Italy

Professor Giovanna Procacci

Political sociology, transformation of citizenship, social rights, social exclusion, immigration policy

University of Milan, Italy

Professor Inger Johanne Sand

Law, public law, legal theory

University of Oslo, Norway

Professor Timo Teräsvirta

Time series econometrics

Aarhus University, Denmark

Professor Göran Therborn

General sociology

University of Cambridge, Great Britain

Professor Liisa Uusitalo

Consumer behaviour (economic & social theory), marketing and communication research

Aalto University, School of Economics, Finland

The panel, independently, evaluated all the submitted material and was responsible for the feedback of the RC-specific reports. The panel members were asked to confirm whether they had any conflict of interests with the RCs. If this was the case, the panel members disqualified themselves in discussion and report writing.

Added expertise to the evaluation was contributed by two members from the Panel of Humanities.

Experts from the Panel of Humanities

Professor Erhard Hinrichs

Professor Pauline von Bonsdorff

EVALUATION OFFICE

Dr Seppo Saari, Doc., Senior Adviser in Evaluation, was responsible for the entire evaluation, its planning and implementation and acted as an Editor-in-chief of the reports.

Dr Eeva Sievi, Doc., Adviser, was responsible for the registration and evaluation material compilations for the panellists. She worked in the evaluation office from August 2010 to July 2011.

MSocSc Paula Ranne, Planning Officer, was responsible for organising the panel meetings and all the other practical issues like agreements and fees and editing a part the RC-specific reports. She worked in the evaluation office from March 2011 to January 2012.

Mr Antti Moilanen, Project Secretary, was responsible for editing the reports. He worked in the evaluation office from January 2012 to April 2012.

TUHAT OFFICE

Provision of the publication and other scientific activity data

Mrs Aija Kaitera, Project Manager of TUHAT-RIS served the project ex officio providing the evaluation project with the updated information from TUHAT-RIS. The TUHAT office assisted in mapping the publications with CWTS/University of Leiden.

MA Liisa Ekebon, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation. She also assisted the UH/Library analyses.

BA Liisa Jäppinen, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation.

HELSINKI UNIVERSITY LIBRARY

Provision of the publication analyses

Dr Maria Forsman, Chief Information Specialist in the Helsinki University Library, managed with her 10 colleagues the bibliometric analyses in humanities, social sciences and in other fields of sciences where CWTS analyses were not applicable.

Acronyms and abbreviations applied in the report

External competitive funding

AF - Academy of Finland
TEKES - Finnish Funding Agency for Technology and Innovation
EU - European Union
ERC - European Research Council
International and national foundations
FP7/6 etc. /Framework Programmes/Funding of European Commission

Evaluation marks

Outstanding (5)
Excellent (4)
Very Good (3)
Good (2)
Sufficient (1)

Abbreviations of Bibliometric Indicators

P - Number of publications
TCS - Total number of citations
MCS - Number of citations per publication, excluding self-citations
PNC - Percentage of uncited publications
MNCS - Field-normalized number of citations per publication
MNJS - Field-normalized average journal impact
THCP10 - Field-normalized proportion highly cited publications (top 10%)
INT_COV - Internal coverage, the average amount of references covered by the WoS
WoS - Thomson Reuters Web of Science Databases

Participation category

Category 1. The research of the participating community represents the international cutting edge in its field.

Category 2. The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.

Category 3. The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.

Category 4. The research of the participating community represents an innovative opening.

Category 5. The research of the participating community has a highly significant societal impact.

Research focus areas of the University of Helsinki

Focus area 1: The basic structure, materials and natural resources of the physical world

Focus area 2: The basic structure of life

Focus area 3: The changing environment - clean water

Focus area 4: The thinking and learning human being

Focus area 5: Welfare and safety

Focus area 6: Clinical research

Focus area 7: Precise reasoning

Focus area 8: Language and culture

Focus area 9: Social justice

Focus area 10: Globalisation and social change

1 Introduction to the Evaluation

1.1 RC-specific evaluation reports

The participants in the evaluation of research and doctoral training were Researcher Communities (hereafter referred to as the RC). The RC refers to the group of researchers who registered together in the evaluation of their research and doctoral training. Preconditions in forming RCs were stated in the Guidelines for the Participating Researcher Communities. The RCs defined themselves whether their compositions should be considered well-established or new.

It is essential to emphasise that the evaluation combines both meta-evaluation¹ and traditional research assessment exercise and its focus is both on the research outcomes and procedures associated with research and doctoral training. The approach to the evaluation is enhancement-led where self-evaluation constituted the main information. The answers to the evaluation questions formed together with the information of publications and other scientific activities an entity that was to be reviewed as a whole.

The present evaluation recognizes and justifies the diversity of research practices and publication traditions. Traditional Research Assessment Exercises do not necessarily value high quality research with low volumes or research distinct from mainstream research. It is challenging to expose the diversity of research to fair comparison. To understand the essence of different research practices and to do justice to their diversity was one of the main challenges of the present evaluation method. Understanding the divergent starting points of the RCs demanded sensitivity from the evaluators.

1.2 Aims and objectives in the evaluation

The aims of the evaluation are as follows:

- to improve the level of research and doctoral training at the University of Helsinki and to raise their international profile in accordance with the University's strategic policies. The improvement of doctoral training should be compared to the University's policy.²
- to enhance the research conducted at the University by taking into account the diversity, originality, multidisciplinary nature, success and field-specificity,
- to recognize the conditions and prerequisites under which excellent, original and high-impact research is carried out,
- to offer the academic community the opportunity to receive topical and versatile international peer feedback,
- to better recognize the University's research potential.
- to exploit the University's TUHAT research information system to enable transparency of publishing activities and in the production of reliable, comparable data.

1.3 Evaluation method

The evaluation can be considered as an enhancement-led evaluation. Instead of ranking, the main aim is to provide useful information for the enhancement of research and doctoral training of the participating RCs. The comparison should take into account each field of science and acknowledge their special character.

¹ The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics or comparable analyses.

² [Policies on doctoral degrees and other postgraduate degrees at the University of Helsinki.](#)

The comparison produced information about the present status and factors that have lead to success. Also challenges in the operations and outcomes were recognized.

The evaluation approach has been designed to recognize better the significance and specific nature of researcher communities and research areas in the multidisciplinary top-level university. Furthermore, one of the aims of the evaluation is to bring to light those evaluation aspects that differ from the prevalent ones. Thus the views of various fields of research can be described and research arising from various starting points understood better. The doctoral training is integrated into the evaluation as a natural component related to research. Operational processes of doctoral training are being examined in the evaluation.

Five stages of the evaluation method were:

1. Registration – Stage 1
2. Self-evaluation – Stage 2
3. TUHAT³ compilations on publications and other scientific activities⁴
4. External evaluation
5. Public reporting

1.4 Implementation of the external evaluation

Five Evaluation Panels

Five evaluation panels consisted of independent, renowned and highly respected experts. The main domains of the panels are:

1. biological, agricultural and veterinary sciences
2. medicine, biomedicine and health sciences
3. natural sciences
4. humanities
5. social sciences

The University invited 10 renowned scientists to act as chairs or vice-chairs of the five panels based on the suggestions of faculties and independent institutes. Besides leading the work of the panel, an additional role of the chairs was to discuss with other panel chairs in order to adopt a broadly similar approach. The panel chairs and vice-chairs had a pre-meeting on 27 May 2011 in Amsterdam.

The panel compositions were nominated by the Rector of the University 27 April 2011. The participating RCs suggested the panel members. The total number of panel members was 50. The reason for a smaller number of panellists as compared to the previous evaluations was the character of the evaluation as a meta-evaluation. The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics and comparable analyses.

The panel meetings were held in Helsinki:

- On 11–13 September 2011: (1) biological, agricultural and veterinary sciences, (2) medicine, biomedicine and health sciences and (3) natural sciences.
- On 18–20 September 2011: (4) humanities and (5) social sciences.

³ TUHAT (acronym) of Research Information System (RIS) of the University of Helsinki

⁴ Supervision of thesis, prizes and awards, editorial work and peer reviews, participation in committees, boards and networks and public appearances.

1.5 Evaluation material

The main material in the evaluation was the RCs' self-evaluations that were qualitative in character and allowed the RCs to choose what was important to mention or emphasise and what was left unmentioned.

The present evaluation is exceptional at least in the Finnish context because it is based on both the evaluation documentation (self-evaluation questions, publications and other scientific activities) and the bibliometric reports. All documents were delivered to the panellists for examination.

Traditional bibliometrics can be reasonably done mainly in medicine, biosciences and natural sciences when using the Web of Science database, for example. Bibliometrics, provided by CWTS/The Centre for Science and Technology Studies, University of Leiden, cover only the publications that include WoS identification in the TUHAT-RIS.

Traditional bibliometrics are seldom relevant in humanities and social sciences because the international comparable databases do not store every type of high quality research publications, such as books and monographs and scientific journals in other languages than English. The Helsinki University Library has done analysis to the RCs, if their publications were not well represented in the Web of Science databases (RCs should have at least 50 publications and internal coverage of publications more than 40%) – it meant 58 RCs. The bibliometric material for the evaluation panels was available in June 2011. The RC-specific bibliometric reports are attached at the end of each report.

The panels were provided with the evaluation material and all other necessary background information, such as the basic information about the University of Helsinki and the Finnish higher education system.

Evaluation material

1. Registration documents of the RCs for the background information
2. Self evaluation material – answers to the evaluation questions
3. Publications and other scientific activities based on the TUHAT RIS:
 - 3.1. statistics of publications
 - 3.2. list of publications
 - 3.3. statistics of other scientific activities
 - 3.4. list of other scientific activities
4. Bibliometrics and comparable analyses:
 - 4.1. Analyses of publications based on the verification of TUHAT-RIS publications with the Web of Science publications (CWTS/University of Leiden)
 - 4.2. Publication statistics analysed by the Helsinki University Library - mainly for humanities and social sciences
5. University level survey on doctoral training (August 2011)
6. University level analysis on publications 2005–2010 (August 2011) provided by CWTS/University of Leiden

Background material

University of Helsinki

- [Basic information about the University of the Helsinki](#)
- [The structure of doctoral training at the University of Helsinki](#)
- Previous evaluations of research at the University of Helsinki – links to the reports: [1998](#) and [2005](#)

The Finnish Universities/Research Institutes

- [Finnish University system](#)
- [Evaluation of the Finnish National Innovation System](#)
- [The State and Quality of Scientific Research in Finland. Publication of the Academy of Finland 9/09.](#)

The evaluation panels were provided also with other relevant material on request before the meetings in Helsinki.

1.6 Evaluation questions and material

The participating RCs answered the following evaluation questions which are presented according to the evaluation form. In addition, TUHAT RIS was used to provide the **additional material** as explained. For giving the feedback to the RCs, the panellists received the evaluation feedback form constructed in line with the evaluation questions:

1. Focus and quality of the RC's research

- Description of
 - the RC's research focus.
 - the quality of the RC's research (incl. key research questions and results)
 - the scientific significance of the RC's research in the research field(s)
- Identification of the ways to strengthen the focus and improve the quality of the RC's research

The additional material: TUHAT compilation of the RC's publications, analysis of the RC's publications data (provided by University of Leiden and the Helsinki University Library)

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

2. Practises and quality of doctoral training

- Organising of the doctoral training in the RC. Description of the RC's principles for:
 - recruitment and selection of doctoral candidates
 - supervision of doctoral candidates
 - collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes
 - good practises and quality assurance in doctoral training
 - assuring of good career perspectives for the doctoral candidates/fresh doctorates
- Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

3. The societal impact of research and doctoral training

- Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).
- Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.

The additional material: TUHAT compilation of the RC's other scientific activities.

A written feedback from the aspects of: societal impact, national and international collaboration, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

4. International and national (incl. intersectoral) research collaboration and researcher mobility

- Description of
 - the RC's research collaborations and joint doctoral training activities
 - how the RC has promoted researcher mobility
- Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

A written feedback from the aspects of: scientific quality, national and international collaboration

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

5. Operational conditions

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).
- Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

6. Leadership and management in the researcher community

- Description of
 - the execution and processes of leadership in the RC
 - how the management-related responsibilities and roles are distributed in the RC
 - how the leadership- and management-related processes support
 - high quality research
 - collaboration between principal investigators and other researchers in the RC
 - the RC's research focus
 - strengthening of the RC's know-how
- Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes

7. External competitive funding of the RC

- The RCs were asked to provide information of such external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- On the e-form the RCs were asked to provide:
 - 1) The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation , EU, ERC, foundations, other national funding organisations, other international funding organisations), and
 - 2) The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.

Competitive funding reported in the text is also to be considered when evaluating this point.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness, future significance

- Strengths
- Areas of development
- Other remarks
- Recommendations

8. The RC's strategic action plan for 2011–2013

- RC's description of their future perspectives in relation to research and doctoral training.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

- Strengths
- Areas of development

- Other remarks
- Recommendations

9. Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category

A written feedback evaluating the RC's fitness to the chosen participation category

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

10. Short description of how the RC members contributed the compilation of the stage 2 material

Comments on the compilation of evaluation material

11. How the UH's focus areas are presented in the RC's research?

Comments if applicable

12. RC-specific main recommendations based on the previous questions 1-11

13. RC-specific conclusions

1.7 Evaluation criteria

The panellists were expected to give evaluative and analytical feedback to each evaluation question according to their aspects in order to describe and justify the quality of the submitted material. In addition, the evaluation feedback was asked to be pointed out the level of the performance according to the following classifications:

- outstanding (5)
- excellent (4)
- very good (3)
- good (2)
- sufficient (1)

Evaluation according to the criteria was to be made with thorough consideration of the entire evaluation material of the RC in question. Finally, in questions 1-4 and 9, the panellists were expected to classify their written feedback into one of the provided levels (the levels included respective descriptions, 'criteria'). Some panels used decimals in marks. The descriptive level was interpreted according to the integers and not rounding up the decimals by the editors.

Description of criteria levels

Question 1 – FOCUS AND QUALITY OF THE RC'S RESEARCH

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Outstandingly strong research, also from international perspective. Attracts great international interest with a wide impact, including publications in leading journals and/or monographs published by leading international publishing houses. The research has world leading qualities. The research focus, key research questions scientific significance, societal impact and innovativeness are of outstanding quality.

In cases where the research is of a national character and, in the judgement of the evaluators, should remain so, the concepts of "international attention" or "international impact" etc. in the grading criteria above may be replaced by "international comparability".

Operations and procedures are of outstanding quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality.

Excellent quality of procedures and results (4)

Research of excellent quality. Typically published with great impact, also internationally. Without doubt, the research has a leading position in its field in Finland.

Operations and procedures are of excellent quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality.

Very good quality of procedures and results (3)

The research is of such very good quality that it attracts wide national and international attention.

Operations and procedures are of very good quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Good research attracting mainly national attention but possessing international potential, extraordinarily high relevance may motivate good research.

Operations and procedures are of good quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

In some cases the research is insufficient and reports do not gain wide circulation or do not have national or international attention. Research activities should be revised.

Operations and procedures are of sufficient quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 2 – DOCTORAL TRAINING

Question 3 – SOCIETAL IMPACT

Question 4 – COLLABORATION

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Procedures are of outstanding quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality. The procedures and results are regularly evaluated and the feedback has an effect on the planning.

Excellent quality of procedures and results (4)

Procedures are of excellent quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality. The procedures and outcomes are evaluated and the feedback has an effect on the planning.

Very good quality of procedures and results (3)

Procedures are of very good quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and

management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Procedures are of good quality, shared occasionally in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

Procedures are of sufficient quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 9 – CATEGORY

Participation category – fitness for the category chosen

The choice and justification for the chosen category below should be reflected in the RC's responses to the evaluation questions 1–8.

1. *The research of the participating community represents the international cutting edge in its field.*
2. *The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.*
3. *The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.* The research is of high quality and has great significance and impact in its field. However, the generally used research evaluation methods do not necessarily shed sufficient light on the merits of the research.
4. *The research of the participating community represents an innovative opening.* A new opening can be an innovative combination of research fields, or it can be proven to have a special social, national or international demand or other significance. Even if the researcher community in its present composition has yet to obtain proof of international success, its members can produce convincing evidence of the high level of their previous research.
5. *The research of the participating community has a highly significant societal impact.* The participating researcher community is able to justify the high social significance of its research. The research may relate to national legislation, media visibility or participation in social debate, or other activities promoting social development and human welfare. In addition to having societal impact, the research must be of a high standard.

An example of outstanding fitness for category choice (5)⁵

The RC's representation and argumentation for the chosen category were convincing. The RC recognized its real capacity and apparent outcomes in a wider context to the research communities. The specific character of the RC was well-recognized and well stated in the responses. The RC fitted optimally for the category.

- Outstanding (5)
- Excellent (4)
- Very good (3)
- Good (2)
- Sufficient (1)

The above-mentioned definition of outstanding was only an example in order to assist the panellists in the positioning of the classification. There was no exact definition for the category fitness.

⁵ The panels discussed the category fitness and made the final conclusions of the interpretation of it.

1.8 Timetable of the evaluation

The main timetable of the evaluation:

- | | |
|--|-----------------------|
| 1. Registration | November 2010 |
| 2. Submission of self-evaluation materials | January–February 2011 |
| 3. External peer review | May–September 2011 |
| 4. Published reports | March–April 2012 |
| - University level public report | |
| - RC specific reports | |

The entire evaluation was implemented during the university's strategy period 2010–2012. The preliminary results were available for the planning of the following strategy period in late autumn 2011. The evaluation reports will be published in March/April 2012. More detailed time schedule is published in the University report.

1.9 Evaluation feedback – consensus of the entire panel

The panellists evaluated all the RC-specific material before the meetings in Helsinki and mailed the draft reports to the evaluation office. The latest interim versions were on-line available to all the panellists on the Wiki-sites. In September 2011, in Helsinki the panels discussed the material, revised the first draft reports and decided the final numeric evaluation. After the meetings in Helsinki, the panels continued working and finalised the reports before the end of November 2011. The final RC-specific reports are the consensus of the entire panel.

The evaluation reports were written by the panels independently. During the editing process, the evaluation office requested some clarifications from the panels when necessary. The tone and style in the reports were not harmonized in the editing process. All the reports follow the original texts written by the panels as far as it was possible.

The original evaluation material of the RCs, provided for the panellists is attached at the end of the report. It is essential to notice that the exported lists of publications and other scientific activities depend how the data was stored in the TUHAT-RIS by the RCs.

2 Evaluation feedback

2.1 Focus and quality of the RC's research

- *Description of*
 - *the RC's research focus*
 - *the quality of the RC's research (incl. key research questions and results)*
 - *the scientific significance of the RC's research in the research field(s)*
- *Identification of the ways to strengthen the focus and improve the quality of the RC's research*

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness

CNC focuses on research in cognitive sciences (auditory processing, language, music, memory, attention, development of cognitive processes, learning, and brain plasticity) using a multidisciplinary approach that spans across psychology, social sciences, neurosciences, and brain imaging. Multimethod approach includes EEG, MEG, fMRI, PET, NIRS and TMS. Innovative techniques are used, such as MEG of fetal brain during pregnancy to map auditory development/memory.

Strengths: By comparison with other RCs, this is a relatively small, but highly productive research community with an excellent publication record (260 in articles in 2005-2010) and a proven track record of excellence (e.g. leading participation in national Centers of Excellence). Several PI's in the RC are highly cited and internationally highly renowned researchers. Research results include innovative breakthroughs that are highly acknowledged at an international level and are highly cited. The articles appear in high impact journals in the field. The emphasis of the RC lies in high quality research (as well as high quantity), which is also translated into the doctoral training. Several students have received highest possible grades and competitive awards. The research is embedded in a collaborative network of international collaborators. External research funding is high. By traditional criteria (publications, impact, citations, h-index, funding volume), this RC is outstanding.

Areas of development: Given its relatively modest size, adding postdoctoral positions, as indicated in the proposal, constitutes a strategic measure for further strengthening this RC.

Recommendations: The proposal lists examples of recent research accomplishments. It would be advantageous to additionally see a presentation of the main research themes of the RC and their interconnection.

Numeric evaluation: 5 (Outstanding)

2.2 Practises and quality of doctoral training

- *Organising of the doctoral training in the RC. Description of the RC's principles for:*
 - *recruitment and selection of doctoral candidates*
 - *supervision of doctoral candidates*
 - *collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes*
 - *good practises and quality assurance in doctoral training*
 - *assuring of good career perspectives for the doctoral candidates/fresh doctorates*
- *Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.*
- *Additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations*

ASPECTS: Processes and good practices related to leadership and management

Strengths: The objective of training internationally competitive scientists in the relevant disciplines of this RC is clearly the right objective given the past successes of this RC. Recruitment via the M.A. program with the M.A. thesis serving as a kind of apprenticeship stage appears effective.

A strength of this program is that students have access to a wide variety of research methods in which they can be trained. It is a further strength that students of diverse backgrounds (psychology, biology, linguistics, engineering, medicine, etc.) are recruited, promoting multidisciplinary thinking. CNC students also have laboratory practical rotations.

High quality as well as high quantity (4 instead of 3 publications required by UH standard) are necessary to obtain the doctoral degree. It is a strength that doctoral students are trained to be able to publish in high impact journals. The articles included in theses have appeared in high ranking journals and the students have obtained high grades.

Another strength is that the doctoral program is embedded in a national Graduate School of Psychology; several members of this RC have taken leadership roles in the graduate school. Members of this RC also direct the doctoral program for the Faculty of the Institute of Behavioral Sciences as a whole.

The RC has a relative large amount of doctoral students considering its size (currently 20). It is stated that there is a proportion of international doctoral students and that 5 of their previous candidates now work abroad. It appears that international mobility is encouraged.

Overall the doctoral training seems to be outstanding.

Other remarks: It would be interesting to learn about the mix of local, national, and international recruitment and admission of doctoral students. What measures are taken/have been taken to advertise on the national and international scale?

It would also be interesting to learn about whether there is an increasing trend in accepting more doctoral students or whether there are 'drop-outs' of doctoral students. E.g., it is stated in the text that 14 candidates completed their degrees in 2005 - 2010 (i.e. 2.1 per year). Currently, there are 20 students enrolled in doctoral training (in 2011).

Numeric evaluation: 5 (Outstanding)

2.3 The societal impact of research and doctoral training

- *Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).*
- *Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.*
- *Additional material: TUHAT compilation of the RC's other scientific activities.*

ASPECTS: Societal impact, national and international collaboration, innovativeness

The RC is very active in societal outreach and providing relevant input on the relevance of its research results.

Recommendation

Given the high level of interest in brain and life science research, it would be worth-while if the RC would host an open-house event for the general public and especially for high-school age youths. This could spark interest and help recruit talented students.

Given the overhead associated with such events and given the most size of the RC at present, it is understandable if this would be difficult to realize at the moment. But if the planned recruitment of additional postdocs is successful, then asking a team of postdocs and administrative staff to plan such an event would be worth-while.

The RC has been very active in public media interviews and talks, disseminating research results to the public. Many of their research findings have direct applicability to be translated in interventions (i.e. prevention of dyslexia in children at risk through computer training). It would be recommendable to increase efforts to work with policy makers or decision makers for example in the school system to implement such measures. Members of the RC could be consultants to Ministry of Education. The same

holds true for clinical guidelines. The RC should extend their efforts to work together with governmental committees/institutes in order to maximize translation and societal impact of their research.

Numeric evaluation: 3 (Very good)

2.4 International and national (incl. intersectoral) research collaboration and researcher mobility

- *Description of*
 - *the RC's research collaborations and joint doctoral training activities*
 - *how the RC has promoted researcher mobility*
- *Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.*

ASPECTS: Scientific quality, national and international collaboration

Strengths: The RC is clearly very well-connected at the national and international level, including outside of Europe. The fact that for 7 out of 13 PhD (on page 2 they say there were 14 theses) theses completed during the assessment period thesis-related articles included senior international partners as co-authors attests to the fact that these are active and highly productive research collaborations.

Numeric evaluation: 5 (Outstanding)

2.5 Operational conditions

- *Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).*
- *Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.*

ASPECTS: Processes and good practices related to leadership and management

Strengths

The research agenda of this RC spans a wide variety of experimental techniques, each requiring their dedicated equipment. The RC has forged cooperations with other institutions and through successful grant applications been able to ensure adequate access to the necessary hardware. More specifically, the CNC has been able to build their own neurophysiological laboratory at the IBS that appears very well equipped, including EEG systems, portable EEGs, eye tracking, TMS. For fMRI, NIRS and PET, they use neuroimaging facilities in the Helsinki area, outside of HU.

Areas of Development

The RC identifies the lack of proper balance between teaching and research as an obstacle for the involvement of senior RC members in research at the level necessary for future growth of this RC.

Recommendations

The UH and the Faculties contributing to this RC need to address the questions of how to add postdoctoral positions and how to ensure a good balance between research and teaching for the members of this RC.

It would be interesting to learn whether there are any issues with using neuroimaging facilities of other facilities (scheduling, data transfer, etc).

2.6 Leadership and management in the researcher community

- *Description of*

- *the execution and processes of leadership in the RC*
- *how the management-related responsibilities and roles are distributed in the RC*
- *how the leadership- and management-related processes support*
 - *high quality research*
 - *collaboration between principal investigators and other researchers in the RC*
 - *the RC's research focus*
 - *strengthening of the RC's know-how*
- *Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes*

ASPECTS: Processes and good practices related to leadership and management

The organizational structure in terms of research groups is a natural one. The RC has good representation of foreign researchers and outstanding representation of women at all levels. The RC is sensitive to ethnic diversity. There is also consideration of welfare outside of the work environment, e.g., there seem to be social activities to strengthen welfare of students.

It remains unclear whether and how students are involved in management decisions. It also remains unclear how/whether the 4 subgroups in the RC communicate or facilitate knowledge transfer, etc. Are there common meetings including all members of the RC?

2.7 External competitive funding of the RC

- *The RCs were asked to provide information of such external competitive funding, where:*
 - *the funding decisions have been made during 1.1.2005–31.12.2010, and*
 - *the administrator of the funding is/has been the University of Helsinki*
- *On the e-form the RCs were asked to provide:*
 - 1) *The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organizations), and*
 - 2) *The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.*

Competitive funding reported in the text is also to be considered when evaluating this point.

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness and future significance

Strengths: The funding efforts of this RC are exemplary. More than 6 Million Euros have been awarded in the evaluation periods from AF, TEKES, EU, foundations and student programs.

Recommendations: In order to sustain and to increase external funding, the RC needs adequate institutional support.

2.8 The RC's strategic action plan for 2011–2013

- *RC's description of their future perspectives in relation to research and doctoral training.*

ASPECTS: Scientific quality, scientific significance, societal Impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

Strengths: The RC has clear strategic goals for expanding the current research agenda. The plans for continued external funding and targeting new funding sources is also convincing.

2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category.

Category 1. The research of the participating community represents the international cutting edge in its field.

The chosen participation category is entirely fitting.

Numeric evaluation: 5 (Outstanding)

2.10 Short description of how the RC members contributed the compilation of the stage 2 material

The compilation was a group effort, with professorial members of the RC compiling materials for their research groups.

2.11 How the UH's focus areas are presented in the RC's research

Focus area 4: The thinking and learning human being

The fit with UH's focus area "The thinking and learning human being" is a natural one.

2.12 RC-specific main recommendations

- Emphasize main common research themes of the RC and their interconnection.
- Extend efforts to work together with governmental committees/institutes in order to maximize translation and societal impact of their research.
- To ensure sustained high external funding the RC needs adequate institutional support.
- The UH and the Faculties contributing to this RC need to address the questions of how to add postdoctoral positions and how to ensure a good balance between research and teaching for the members of this RC.

2.13 RC-specific conclusions

Overall this is a highly successful RC with cutting edge research, an excellent output of high quality doctoral candidates, and extensive external funding. University resources might help this RC to overcome imbalance of teaching/research and increase its size.

3 Appendices

- A. Original evaluation material
 - a. Registration material – Stage 1
 - b. Answers to evaluation questions – Stage 2
 - c. List of publications
 - d. List of other scientific activities
- B. Bibliometric analyses
 - a. Analysis provided by CWTS/University of Leiden
 - b. Analysis provided by Helsinki University Library (66 RCs)



International evaluation of research and doctoral training
at the University of Helsinki 2005-2010

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW

NAME OF THE RESEARCHER COMMUNITY:

Cognitive Neuroscience Cluster (CNC)

LEADER OF THE RESEARCHER COMMUNITY:

Professor Teija Kujala, Institute of Behavioural Sciences, Faculty of Behavioural Sciences

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW:

- Material submitted by the RC at stages 1 and 2 of the evaluation
 - STAGE 1 material: RC's registration form (incl. list of RC participants in an excel table)
 - STAGE 2 material: RC's answers to evaluation questions
- TUHAT compilations of the RC members' publications 1.1.2005-31.12.2010
- TUHAT compilations of the RC members' other scientific activities 1.1.2005-31.12.2010
- Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010 (analysis carried out by CWTS, Leiden University)

NB! Since Web of Science(WoS)-based bibliometrics does not provide representative results for most RCs representing humanities, social sciences and computer sciences, the publications of these RCs will be analyzed by the UH Library (results available by the end of June, 2011)



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RC-SPECIFIC STAGE 1 MATERIAL (registration form)

1 RESPONSIBLE PERSON

Name: Kujala, Teija

E-mail:

Phone: +358-9-19129838

Affiliation: Cognitive Brain Research Unit, Institute of Behavioural Sciences, UH

Street address: Siltavuorenpenger 1B, 00014 Univ. Helsinki

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): Cognitive Neuroscience Cluster

Acronym for the participating RC (max. 10 characters): CNC

Description of the operational basis in 2005-2010 (eg. research collaboration, joint doctoral training activities) on which the RC was formed (MAX. 2200 characters with spaces): Cognitive Neuroscience Cluster (CNC) is composed of three groups, Cognitive Brain Research Unit (CBRU), Cognitive Science (CS), and Attention and Memory Networks (AMN). They belong to the Institute of Behavioural Sciences (IBS), University of Helsinki. IBS was established in 2010 and it includes the Department of Psychology, the former home department of CNC research groups. These groups collaborate in research, supervision of doctoral students, and teaching. This collaboration will be further strengthened in the future, as the research topics (e.g., auditory processing, language, music, memory, attention, development of cognitive processes, learning, and brain plasticity) of the groups are highly synergetic and the groups use the same or complementary brain research methods, e.g., electroencephalography (EEG), magnetoencephalography (MEG), functional magnetic resonance imaging (fMRI), positron emission tomography (PET), transcranial magnetic stimulation (TMS), and near-infrared spectroscopy (NIRS).

3 SCIENTIFIC FIELDS OF THE RC

Main scientific field of the RC's research: social sciences

RC's scientific subfield 1: Psychology, Experimental

RC's scientific subfield 2: Neurosciences

RC's scientific subfield 3: Neuroimaging

RC's scientific subfield 4: Psychology, Multidisciplinary

Other, if not in the list:

4 RC'S PARTICIPATION CATEGORY

Participation category: 1. Research of the participating community represents the international cutting edge in its field



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Justification for the selected participation category (MAX. 2200 characters with spaces): CNC chose the participation category 1 since its research is well-known in the field of cognitive neuroscience and internationally acknowledged. In 2005-2010, CNC has published 260 articles in international peer-reviewed journals. Among these, there are publications in high-ranking journals (impact factor 9 or more) such as Behavioral and Brain Sciences, Proceedings of the National Academy of Sciences, Progress in Neurobiology, Annals of Neurology, Brain, and Biological Psychiatry. The senior scientists of CNC are internationally well-known and highly cited. For instance, Prof. Näätänen belongs to the 0.5% of the most cited living scientists. Importantly, in 2005-2010 these groups have belonged to the Centers of Excellence of the Academy of Finland and the Joint Committee of the Nordic Research Councils in Humanities and Social Sciences (NOS-HS). They have also been successful in acquiring competed external research funding, in 2005-2010 over 6 000 000 € in total. The research of CNC is implemented in a multidisciplinary (psychology, neurosciences, medicine, phonetics, logopedics, physics, engineering, educational science, musicology, and music therapy and education) collaboration network. In Finland it includes the Universities of Turku, Jyväskylä, and Oulu, and the Aalto and Åbo Akademi Universities, Sibelius Academy, as well as many research institutes. Abroad, it includes laboratories in, e.g., Australia, Canada, Denmark, Estonia, France, Germany, Hungary, Italy, Japan, Norway, Russia, Spain, and USA. CNC has also established international projects and training networks as a partner and a coordinator (Master Program of Neuroscience 'From Neuron to Cognition' (TEMPUS) 2005-2009, Erasmus Mundus Training Network in Auditory Cognitive Neuroscience 2010-2014; Tuning the Brain for Music 2006-2009). CNC has educated internationally competitive scientists. Of the 14 doctoral theses completed at CNC during 2005-2010, the majority obtained the highest or the second highest grade (laudatur or eximia cum laude approbatur, respectively) and four were awarded for their high quality with special awards. Of these PhDs, five are currently working in laboratories abroad.

5 DESCRIPTION OF THE RC'S RESEARCH AND DOCTORAL TRAINING

Public description of the RC's research and doctoral training (MAX. 2200 characters with spaces): The research of CNC focuses on cognitive processes, such as auditory perception (including speech and music perception), memory, attention, and executive functions. CNC strives for increasing understanding of neural mechanisms of these processes, their life-long development, their impairments, and plasticity associated with learning, recovery, and amelioration caused by intervention. The work of the scientists of CNC has resulted in several important breakthroughs. For instance, it has demonstrated that intervention causes neural plastic changes and improvement in language skills in dyslexia and in cognitive and emotional recovery after a stroke. It has also revealed the neural determinants of congenital and acquired amusia. Furthermore, it has shown that brain networks of involuntary and voluntary attention largely overlap in audition unlike in vision. To this end, the world-wide multidisciplinary expert collaboration network is in central role. Furthermore, the CNC has a modern neurophysiology laboratory including high-density EEG facilities and autonomic nervous system sensors as well as mobile EEG systems that are optimal for studies in natural environments. Furthermore, a navigated TMS device combined with EEG will be acquired in the near future. Moreover, CNC has an access to the excellent neuroimaging facilities in the Helsinki metropolitan areas including MEG, fMRI, TMS, and NIRS. The research of CNC is tightly integrated with doctoral training. The vast majority of the research projects are carried out in teams including both senior scientists and doctoral students, of whom there are currently more than 20 at CNC. The students are encouraged and supported to aim at high-quality scientific work. In addition to their research, doctoral students of CNC have participated in activities of the national Graduate School in Psychology and the CNC



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RC-SPECIFIC STAGE 1 MATERIAL (registration form)

senior personnel has been active in its management (in 1998-2006 one of the CNC Principal Investigators, Prof. Alho was the director of this graduate school and another CNC Principal Investigator, Prof. Kujala is currently its vice director) and the Nordic-Baltic Doctoral Network in Psychology (directed by Prof. Alho).

Significance of the RC's research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): High quality and quantity in research and doctoral training are the cornerstones for the success of the University of Helsinki (UH). CNC's high productivity in 2005-2010 is indicated by the high number of scientific articles (260) and doctoral theses (14). The high quality of CNC's research is indicated by the quality of journals where these articles have been published. The high quality of CNC doctoral theses, in turn, is evidenced by the high grades and by recruitment of CNC alumni to post-doctoral positions in other domestic and foreign universities. The high-quality research of CNC is also reflected in undergraduate education in Psychology and Cognitive Science at UH. For example, bachelor's and master's theses are supervised at CNC, and CNC members holding UH professorships and lecturerships in 2005-2010 (Profs. Alho, Kujala, Krause, and Drs. Paavilainen and Rinne) have been responsible for undergraduate cognitive neuroscience and other courses in Psychology and Cognitive Science. In addition, members of CNC organize courses available to all doctoral students of the Faculty of Behavioral Sciences, the national Psychology Graduate School (directed in 1998-2006 by Prof. Alho; Prof. Kujala being its current vice director), and the Nordic-Baltic Doctoral Network in Psychology (directed by Prof. Alho). The success of UH is very dependent on external funding. In 2005-2010, CNC has brought over 6 000 000 € competed funding to UH. Another key to the success of UH is collaboration. A significant portion of the research of CNC results from international, as well as national, collaboration, for example within the Helsinki Brain Research Center, a national Center of Excellence (CoE; 2002-2007) directed by Prof. Näätänen, the Finnish CoE (2008-2013) in Interdisciplinary Music Research to which Prof. Tervaniemi and Dr. Huotilainen belong, and the Nordic CoE (2005-2010) in Cognitive Control to which Prof. Alho and Dr. Rinne belong. CNC has been also successful in international recruitment of doctoral students: more than one third of doctoral theses accepted in 2005-2010 and supervised at CNC were by foreign doctoral students.

Keywords: cognitive neuroscience, speech perception, music perception, attention, memory, learning

6 QUALITY OF RC'S RESEARCH AND DOCTORAL TRAINING

Justified estimate of the quality of the RC's research and doctoral training at national and international level during 2005-2010 (MAX. 2200 characters with spaces): The high quality of CNC's research is indicated by the fact that the results of this research are published in international peer-reviewed scientific journals. Among these during 2005-2010 are such high-ranking journals as Behavioral and Brain Sciences, Proceedings of the National Academy of Sciences, Annals of Neurology, Brain, Progress in Neurobiology, Biological Psychiatry, Journal of Neuroscience, Cerebral Cortex, Journal of Cognitive Neuroscience, and Neuroimage. The quality of CNC's research is also indicated by h-indices of CNC Principal Investigators (Prof. Näätänen 71, Prof. Alho 53, and Prof. Kujala, Prof. Tervaniemi, and Dr. Huotilainen over 25). Moreover, Prof. Näätänen belongs to the 0.5% of the most cited living scientists and Prof. Alho is the second most cited Finnish scientist in the field of psychology.

Doctoral training at CNC is also of high quality according to international and national standards. All doctoral theses supervised at CNC include at least four articles published in peer-reviewed international scientific journals, the doctoral student being the first author in at least three of them. At least four articles



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RC-SPECIFIC STAGE 1 MATERIAL (registration form)

are required although the Faculty of Behavioural Sciences would accept doctoral theses including three articles. Moreover, at CNC, all articles of doctoral theses must be published or accepted for publication, although in some faculties at UH and at some other Finnish universities, doctoral theses may include manuscripts not yet accepted for publication. The high quality of CNC doctoral theses is also indicated by high grades they received after external review by national and international experts. In 2005—2010, all CNC doctoral theses got at least the third highest grade (*magna cum laude approbatur*) on the eight-step scale (used in its full length according to the guidelines of the Faculty of Behavioural Sciences) and the majority got the highest or the second highest grade (*laudatur* or *eximia cum laude approbatur*, respectively). Four of these theses were awarded for their high quality (by the Finnish Academy of Science and Letters, Brain Research Society of Finland, or Faculty of Behavioural Sciences).

Comments on how the RC's scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): CNC prefers its scientific productivity to be assessed with traditional internationally used methods. The evaluation should focus, for example, on the number of articles published in international peer-reviewed scientific journals, on the quality of these journals (impact factors, rankings of the journals in the field of cognitive neuroscience), number of citations to these articles and the h-indices of CNC Principal Investigators. The evaluation should also take into account the amount of competed external funding granted to the research and the amount of domestic and international research collaboration. The doctoral training should be assessed by evaluating the quantity and quality of doctoral theses supervised at CNC. With respect to the content of research, CNC would be happy to arrange a site visit for the evaluation panel. The site visit would allow the panel also to interview doctoral students and post-doctoral researchers in CNC, as well as CNC alumni, for direct feedback on the quality of doctoral training. With respect to the publishing strategy, CNC aims at publishing all its research in international peer-reviewed scientific journals. Reports on ground-breaking novel results are submitted to the highest quality general and special-field journals.

LIST OF RC MEMBERS

NAME OF THE RESEARCHER COMMUNITY:		Cognitive Neuroscience Cluster			
RC-LEADER		T. Kujala			
CATEGORY		1			
	Last name	First name	PI-status (TUHAT, 29.11.2010)	Title of research and teaching personnel	Affiliation
1	Brattico	Elvira		Doctoral candidate until 2006, Post-doctoral researcher 2009	DP/IBS, FBS, UH *)
2	Huottilainen	Minna	X	Senior researcher	DP/IBS, FBS, UH
3	Ilvonen	Titta		Doctoral candidate (until 2006)	DP/IBS, FBS, UH (until 2006)
4	Istok	Eva		Doctoral candidate	DP/IBS, FBS, UH
5	Jansson-Verkasalo	Eira		Senior researcher	DP/IBS, FBS, UH
6	Koskinen	Sini		Doctoral candidate	DP/IBS, FBS, UH
7	Korostenskaja	Milena		Doctoral candidate (until 2008)	DP/IBS, FBS, UH (until 2008)
8	Krohn	Kaisu		Doctoral candidate	DP/IBS, FBS, UH
9	Kujala	Teija	X	Professor	DP/IBS, FBS, UH
10	Kuuluvainen	Soila		Doctoral candidate	DP/IBS, FBS, UH
11	Mittag	Maria		Doctoral candidate	DP/IBS, FBS, UH
12	Mäki-Karjalainen	Hanna-Mari		Doctoral candidate	DP/IBS, FBS, UH
13	Lepistö	Tuulia		Doctoral candidate (until 2008)	DP/IBS, FBS, UH (until 2008)
14	Lindström	Riikka		Doctoral candidate	DP/IBS, FBS, UH
15	Lovio	Riikka		Doctoral candidate	DP/IBS, FBS, UH
16	Novitski	Nikolai		Doctoral candidate (until 2006)	DP/IBS, FBS, UH (until 2006)
17	Naätänen	Risto	X	Professor	DP/IBS, FBS, UH
18	Osipova	Darja		Doctoral candidate (until 2007)	DP/IBS, FBS, UH (until 2007)
19	Paavilainen	Petri		Senior researcher	DP/IBS, FBS, UH
20	Pakarinen	Satu		Doctoral candidate	DP/IBS, FBS, UH
21	Partanen	Eino		Doctoral candidate	DP/IBS, FBS, UH
22	Putkinen	Vesa		Doctoral candidate	DP/IBS, FBS, UH
23	Rämä	Pia		Post-doctoral researcher	DP/IBS, FBS, UH
24	Shestakova	Anna		Post-doctoral researcher	DP/IBS, FBS, UH (until 2007)
25	Seppänen	Miia		Doctoral candidate	DP/IBS, FBS, UH
26	Simoens	Veerle		Doctoral candidate	DP/IBS, FBS, UH
27	Simola	Petteri		Doctoral candidate	DP/IBS, FBS, UH
28	Särkämö	Teppo		Doctoral candidate	DP/IBS, FBS, UH
29	Takegata	Rika		Post-doctoral researcher	DP/IBS, FBS, UH
30	Teinonen	Tuomas		Doctoral candidate (until 2009)	DP/IBS, FBS, UH (until 2009)
31	Tervaniemi	Mari	X	Professor	DP/IBS, FBS, UH
32	Torppa	Ritva		Doctoral candidate	DP/IBS, FBS, UH
33	van Zuijen	Titia		Doctoral candidate (until 2006)	DP/IBS, FBS, UH (until 2006)
34	Ylinen	Sari		Post-doctoral researcher (Doctoral c	DP/IBS, FBS, UH
35	Krause	Christina	X	Professor	DP/IBS, FBS, UH
36	Hiltunen	Sinikka		Doctoral candidate	DP/IBS, FBS, UH
37	Kuula-Paavola	Liisa		Doctoral candidate	DP/IBS, FBS, UH
38	Leminen	Alina		Doctoral candidate	DP/IBS, FBS, UH
39	Pesonen	Mirka		Doctoral candidate	DP/IBS, FBS, UH
40	Alho	Kimmo	X	Professor	DP/IBS, FBS, UH
41	Gumenyuk	Valentina		Doctoral candidate (until 2005)	DP/IBS, FBS, UH (until 2005)
42	Degerman	Alexander		Doctoral candidate (until 2008)	DP/IBS, FBS, UH (until 2008)
43	Kirjavainen	Siiri		Doctoral candidate	DP/IBS, FBS, UH
44	Koistinen	Sonja		Doctoral candidate	DP/IBS, FBS, UH
45	Kujala	Anu		Doctoral candidate (until 2006)	DP/IBS, FBS, UH (until 2006)
46	Rinne	Teemu	X	Senior researcher (Post-doctoral res	DP/IBS, FBS, UH
47	Salmi	Juha		Doctoral candidate (until 2009)	DP/IBS, FBS, UH (until 2008)
48	Salo	Emma		Doctoral candidate	DP/IBS, FBS, UH

*) DP = Dept. Psychol. (until 2009)
 IBS = Institute of Behavioural Sciences
 FBS = Faculty of Behavioural Science
 UH = University of Helsinki



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RC-SPECIFIC STAGE 2 MATERIAL

BACKGROUND INFORMATION

Name of the RC's responsible person: Kujala, Teija

E-mail of the RC's responsible person:

Name and acronym of the participating RC: Cognitive Neuroscience Cluster, CNC

The RC's research represents the following key focus area of UH: 4. Ajatteleva ja oppiva ihminen – The thinking and learning human being

Comments for selecting/not selecting the key focus area: The CNC research represents several key focus areas of the University of Helsinki: The thinking and learning human being, Language and culture, Clinical research, and Welfare and safety. The CNC research is related to these areas since it addresses the neural basis of learning and recovery, language and music, memory and attention, and impairments of language, music, memory and attentive processes. Of these, the focus area "The thinking and learning human being" best represents CNC research. The central research areas of CNC either relate to neural processes associated with thinking, learning, or both. Perception, communication, memory, and executive processes with which attention control has a major role, are inherently related to thinking. Learning is addressed in several contexts, such as native and foreign language acquisition, musical skill learning, and intervention and rehabilitation induced amelioration of impaired functions.

1 FOCUS AND QUALITY OF RC'S RESEARCH (MAX. 8800 CHARACTERS WITH SPACES)

- **Description of the RC's research focus, the quality of the RC's research (incl. key research questions and results) and the scientific significance of the RC's research for the research field(s).**

The research of Cognitive Neuroscience Cluster (CNC) focuses on human cognitive functions, such as speech and music perception, and attention and memory mechanisms of the brain. These functions are investigated from a dynamic perspective, often with a special emphasis in their development over the life course, their impairments by aging and neurological disorders, as well as their amelioration, e.g., by rehearsal and rehabilitation. Both the behavioral indices of these functions and their neural bases are investigated. To this end, measurements of performance speed and accuracy and behavioral and neuropsychological tests, brain research methods, such as electroencephalography (EEG), magnetoencephalography (MEG), functional magnetic resonance imaging (fMRI), positron emission tomography (PET), transcranial magnetic stimulation (TMS), and near-infrared spectroscopy (NIRS) as well as registration of autonomic nervous system activity and eye movements are used. The research has resulted in more than 260 publications in international peer-reviewed journals in 2005-2010. The high quality of the research is reflected in, for example, articles which have been published in high-ranking journals, such as Proceedings of the National Academy of Sciences (USA), Brain, Progress in Neurobiology, Annals of Neurology, Biological Psychiatry, The Journal of Neuroscience, and Cerebral Cortex.

The high quality of CNC research is reflected in the repetitive selection of its research groups as coordinators or members of Centers of Excellence (CoE). During 2005-2010, its groups have coordinated the Helsinki Brain Research Centre CoE of the Academy of Finland and belonged to the CoE in Interdisciplinary Music Research of the Academy of Finland and to the Nordic CoE in Cognitive Control of the Joint Committee of the Nordic Research Councils for the Humanities and Social Sciences (NOS-HS). CNC research has also received abundantly funding, more than 10.5 million Euros in 2005-2010, when all competed funding is taken into account.



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Furthermore, the publications of the senior scientists of CNC are highly cited. For example, the h-indices of Profs. Näätänen and Alho are 73 and 54, respectively. Prof. Näätänen's publications have been cited over 21200 times and Prof. Alho's over 9000 times. Currently, Prof. Näätänen belongs to the list of the top 0.5 % of the most cited living scientists of the Institute of Scientific Information (ISI). Even quite recent publications have already received high numbers of citations. For example, two reviews by Näätänen et al. (Psychophysiol., 2005; Clin Neurophysiol., 2007) on the neural basis of auditory change detection both have been cited already over 130 times (self-citations excluded). Below are examples of some recently published highlights of CNC research (see also the Figure Appendices):

- Brain responses of 5-month old infants are distinct for audiovisual speech cues that can vs. cannot be fused into a single percept (Kushnerenko et al., Proc. Natl. Acad. Sci., 2008), suggesting that even very young infants perceive speech by integrating auditory and visual information. This highlights the role of visual speech experience during early postnatal development in learning of the phonemes and phonotactics of the native language.
- Brain responses to sound changes were recorded from fetuses with MEG placed on the mother's abdomen over the head of the fetus. We found that the human fetus can form auditory memory traces of sounds that it hears from outside the mother's body (Draganova et al., Neurolm., 2005). These results highlight the importance of early sound environments in the development of the auditory system.
- Music and speech have a high informational and emotional value for human beings. With fMRI recordings, we showed that brain areas encoding music and speech sounds differ from each other in the temporal and frontal lobes (Tervaniemi et al., J. Neurosci., 2006). Moreover, slight variations in pitch and duration of speech sounds activated thalamic structures. This novel finding suggests the involvement of subcortical structures in sound discrimination.
- Complex cognitive processes, from perception to long-term memory storage, require the transient integration of numerous, widely distributed, constantly interacting areas of the brain which may be implemented by the synchronization of neurons into transient oscillatory assemblies at different frequencies. In CNC, brain oscillatory responses have been demonstrated to systematically dissociate between information encoding and recognition, and these responses are modulated also by memory load (e.g, Krause et al., NeuroRep., 2010).
- Speech intervention improves language skills and enhances neural processing in language-impaired 5-year old children (Pihko et al., Cer. Cor., 2007). This enhanced neural processing was evident in both temporal lobes and reflected both improved encoding and discrimination of speech sounds.
- Music listening facilitated both cognitive and emotional recovery in stroke patients (Särkämö et al., Brain, 2008). This was also reflected in preattentive discriminative processing: brain responses reflecting pitch discrimination enhanced after music and audio book listening whereas those reflecting duration discrimination were enhanced by the audio book listening (Särkämö et al., J. Cogn. Neurosci., 2010). These findings have opened new avenues for the use of music in neurological rehabilitation.
- In their review, Kujala and Näätänen (Progr. Neurobiol., 2010) show evidence indicating that with neurophysiological recordings it is possible to directly observe neural processes and their plasticity in the human brain, even in groups that are difficult to investigate, such as infants and aphasic patients.
- With combined EEG and MEG recordings, decreased early auditory cortical responses (P1, N1, MMN) were found in schizophrenic patients and their unaffected co-twins (Ahveninen et al., Biol. Psychiatry,



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2006). Furthermore, the P1 and N1 decreases correlated with the unaffected subjects' genetic resemblance to schizophrenia patients. These results suggest inherited abnormalities in cortical auditory processing in schizophrenia, as reflected by the P1 and N1 responses.

- In a very recent review, Näätänen et al. (Brain, in press) showed that the mismatch negativity brain response provides an index of cognitive decline for different neuropsychiatric and neurological disorders irrespective of their specific etiologies and symptomatologies.

-The brain networks of voluntary and involuntary shifting of auditory attention mapped with fMRI during strictly controlled task performance overlap substantially in the auditory, parietal and frontal cortices (Salmi et al., Brain Res., 2009).

- Our fMRI measurements showed that audio-spatial selective attention does not modulate only cortical activity (Degerman et al., Brain Res., 2006) but also activity in the inferior colliculi of the subcortical auditory pathway (Rinne et al., J. Neurophysiol., 2008). This modulation was observed as enhanced activity in the inferior colliculus contralateral to the attended direction.

- Attentional problems in children with attention-deficit hyperactivity disorder (ADHD) are indicated both by enhanced distraction of their visual task performance caused by task-irrelevant novel sounds and by event-related brain potentials (ERPs) to these distracting sounds (Gumenyuk et al., NeuroRep., 2005).

• **Ways to strengthen the focus and improve the quality of the RC's research.**

There is currently a low number of post-doctoral researchers in the CNC. Recruiting more of them would improve the quality of research. Increased contribution from post-docs to daily supervision of doctoral and undergraduate students would free time of senior researchers to their own scientific activities. Therefore, in the future, funding will be applied for to hire more post-doctoral researchers. In addition, world's leading researchers should be invited to CNC for longer periods, which would facilitate collaborative projects and scientific interaction. CNC has hosted such visitors but mostly for short-term visits. Funding for such visits is currently applied from the FiDiPro (Finland Distinguished Professor) Programme of the Academy of Finland and Tekes (the Finnish Funding Agency for Technology and Innovation). Furthermore, to tackle with the increased administration, additional office personnel would be of enormous help.

2 PRACTISES AND QUALITY OF DOCTORAL TRAINING (MAX. 8800 CHARACTERS WITH SPACES)

- How is doctoral training organised in the RC? Description of the RC's principles for recruitment and selection of doctoral candidates, supervision of doctoral candidates, collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes, good practises and quality assurance in doctoral training, and assuring good career perspectives for the doctoral candidates/fresh doctorates.

Doctoral training in CNC aims at educating internationally competitive scientists, who have potential of becoming leading experts in their fields. To this end, careful selection of doctoral students, individually tailored doctoral training, inspiring and international research environments, and access to an extensive selection of brain research methods are highly important. Students with psychology and other backgrounds, such as biology, speech science, cognitive science, engineering, or medicine, are continuously recruited. This is in line with and promotes the multidisciplinary nature of CNC research. With psychology and cognitive science students, the doctoral training provided by CNC starts as early as during undergraduate studies. Besides enhancing scientific thinking and skills in neuropsychology and



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cognitive neuroscience courses and laboratory practicums, of which CNC personnel has the main responsibility in psychology and cognitive science at the University of Helsinki, B.A. and M.A. theses are supervised in CNC, after which many of the best students continue as PhD students. The M.A. thesis projects provide efficient and practical training for research work, since all experiments are conducted with the aim to publish the results also in international peer-reviewed journals, which has succeeded with only few exceptions. This arrangement results in high-quality M.A. theses and is very motivating for the students, too, since they are also co-authors in the resulting article which often is the first article (of the minimum of 4) to be included in their PhD thesis.

In order to train internationally competitive scientists, the CNC standards of doctoral theses are very high. The requirement of at least 4 publications in international peer reviewed journals, in at least 3 of which the student is the first author, gives excellent training to scientific work. While students are encouraged to tackle even with high-risk research questions with a potential for a major break-through, they are also supported at every stage of the project. Typically, the doctoral student has two supervisors, one supervisor being in many cases from another discipline and sometimes from a foreign laboratory, since the work of CNC is inherently multidisciplinary and involves an extensive national and international collaboration network. This promotes novel ideas for experiments and gives a potential for getting articles accepted in high-ranking journals. This is indeed what has happened. The theses supervised in CNC in 2005-2010 have included publications in journals such as *Trends in Neurosciences*, *Annals of Neurology*, *The Journal of Neuroscience*, *Stroke*, *Brain*, *Journal of Cognitive Neuroscience*. In addition to careful individual supervision and multidisciplinary team work, the high quality of doctoral theses is supported by special courses and seminars organized by CNC. These include theoretical neuroscience courses, seminars with invited internationally leading neuroscientists (e.g., Prof. M. Besson, Prof. F. Pulvermüller, Prof. J. Rauschecker, Prof. E. Schröger, Prof. L. Trainor, Prof. I. Winkler), theoretical and practical hands-on methodological courses, and courses on scientific writing and thinking. Our practices in doctoral training have resulted in high quality of doctoral theses. This is reflected in the high grades of the theses, ranging from *laudatur* (the highest grade) to *magna cum laude approbatur* (the 3rd highest of the 7 accepted grades) and in the prizes received by the theses (D. Osipova, S. Palva, J. Salmitaival, S. Ylinen). Of the 13 CNC PhD theses approved in 2005-2010, three, i.e., 23%, got the grade *laudatur* and six, i.e., 46%, got the second highest grade, *eximia cum laude approbatur*, while the respective percentages were markedly lower, i.e., 15% and 33%, for the 48 other PhD theses accepted during the same period in Psychology and Cognitive Science at the University of Helsinki.

The senior scientists of CNC are actively involved in graduate schools and arranging doctoral courses and training in which also CNC students actively participate. For example, Prof. Alho was the director of the Graduate School of Psychology (now called the National Doctoral Program in Psychology; <http://www.dopsy.fi/>) in 1998-2006, Prof. Tervaniemi served as its board member 2003-2006, and Prof. Kujala served as its deputy board member in 2006-2010 and as its vice director since Fall 2010. Dr. Huotilainen and Prof. Tervaniemi belonged to the board of Pythagoras Graduate School on Musicology until 2006. Several CNC students have received their salary through these graduate schools. Moreover, Prof. Alho has been the director and Prof. Näätänen an active faculty member of the Nordic-Baltic Doctoral Network in Psychology (<http://nbnpuutu.fi/>) since 2005. Also the National Doctoral Program in Psychology belongs to this network.

The senior scientists of CNC have developed and coordinated doctoral training also locally at the Department of Psychology (Institute of Behavioral Sciences, since 2010) and at the Faculty of Behavioral Sciences. For instance, Prof. Alho, who also is Vice Dean of the Faculty of Behavioral Sciences, has been responsible for directing the doctoral education activities there. Furthermore, Prof. Tervaniemi, Prof.



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Kujala, and Dr. Rinne have been the coordinators of doctoral studies of the Department of Psychology. CNC has also organized special courses for doctoral students locally and nationally. For instance, the course on Integrative Neuroscience, organized biannually, aims at giving insight to the use of different brain research methods. This course has been available to students in Institute of Behavioral Sciences, other neuroscience students in the Helsinki Metropolitan Area (e.g., Aalto University), as well as to all psychology students in Finland through on-line video broadcasting. Prof. Näätänen has been actively teaching on scientific writing courses organized by the National Doctoral Program in Psychology and by the Faculty of Behavioral Sciences of the University of Helsinki. Moreover, he has been in the faculty of the Winter School organized annually by the Centre for International Mobility to recruit foreign, especially Russian students, to Finnish doctoral programs and post-doctoral positions.

The requirement of high quality and the implementation of doctoral training described above should result in competent PhDs having good career perspectives. This is indeed the case, judging from the success of the doctoral students who received their PhD in CNC in 2005-2010. Five of them continued their research work as post doctoral scientists abroad and four in Finland, three of them are now clinical neuropsychologists and one is a high-school teacher.

- RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The strengths of CNC in doctoral training are the strong scientific backgrounds of the senior researchers, their experience in developing doctoral training practices, and the multidisciplinary approach and collaboration network involving several laboratories in Finland and abroad. High-quality doctoral theses are also facilitated by the research environment with versatile brain-research methods and courses organized by CNC researchers, promoting methodological, experimenting, and writing skills in addition to enhancing knowledge on neuroscience. Furthermore, the approach of systematic scientific training starting already at the undergraduate level and continuing with two doctoral studies supervisors, strongly supports doctoral training. The challenge in the doctoral training of the CNC is the low mentor/student ratio. A larger number of post doctoral and senior researchers should be acquired to overcome this problem.

3 SOCIETAL IMPACT OF RESEARCH AND DOCTORAL TRAINING (MAX. 4400 CHARACTERS WITH SPACES)

- Description of how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).

The societal impact of CNC includes visibility in the media, dissemination of scientific results to the public and professionals, e.g., in education and health care, and activities improving doctoral training in Finland and in the Nordic-Baltic region. Importantly, some of the CNC focus areas yield knowledge directly applicable to societal purposes.

The CNC research directly contributes to the society by, for example, scientifically testing the effectiveness of learning technology or intervention programs and approaches. For example, recent CNC results (Särkämö et al., Brain, 2008) showed that music listening facilitates recovery of cognitive skills and mood in stroke patients. This important finding has a potentially wide impact, since music listening is an inexpensive form of therapy, applicable at home and in hospitals. In addition, CNC researchers (Lovio et al., submitted) found that the pre-reading skills of preschool children at dyslexia risk can be improved with a special computer program in just 3 hours of training in total. Thus, reading-acquisition can be supported before school, giving children at dyslexia risk a better starting point for school.



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In 2005-2010, CNC researchers gave about a 100 interviews for television and radio channels and newspapers in Finland and abroad. For example, the afore-mentioned remediating effect of music on stroke patients attracted the interest of the media world-wide, e.g., Reuters (UK), AFP (France), Los Angeles Times (USA), and BBC Radio (UK).

CNC has disseminated knowledge on brain processes and development, brain's health and life-long adaptability by giving talks and arranging occasions for general public. Some of these were very popular. For example, during the Brain Awareness Week (2007), an occasion on the brain's health with expert speakers attracted a full lecture hall of audience, of more than 550 seats. In the context of EU-funded Braintuning project, Music and Emotion day with demonstrations and lectures was organized, attracting over 150 participants. Also the Finnish science center Heureka, has used the expertise of CNC: Prof. Kujala was invited to serve as an expert on learning and plasticity in an international project Science Changing the World in 2010 (involving France, the Netherlands, Portugal, and Finland). Heureka also consulted Prof. Tervaniemi in 2005 for installations for musicality measurements. In 2005-2010, Profs. Alho (the director of CICERO Learning in 2009–2010) and Näätänen were board members in the CICERO Learning Network (www.cicero.fi) promoting multidisciplinary research on learning and disseminating results of this research to the general public and professionals.

The societal impact of CNC doctoral training is evident both in the systematic work of its senior scientists in developing doctoral training practices, including practices in the nation-wide graduate schools, and in the careers of the individuals who have received their PhD in CNC. One indication of the societal impact of this work is that some of CNC PhD students acquire a non-academic career after the Dissertation. In 2005-2010, a significant number of the 13 CNC PhD students ended at such professions, e.g., 3 work now as clinical neuropsychologists and 1 as a high-school teacher.

- Ways to strengthen the societal impact of the RC's research and doctoral training.

CNC researchers could even more actively inform professionals of education, health care, as well as medicine on their research findings. In parallel, the general public should be more effectively contacted by more actively reporting the media on new research results. CNC should also aim at affecting more strongly national research and doctoral program policies. Moreover, the number of collaborative projects between CNC and the public health and educational systems could be increased. CNC might also adopt a more active role regarding commercialization of some technical innovations which are currently under development.

4 INTERNATIONAL AND NATIONAL (INCL. INTERSECTORAL) RESEARCH COLLABORATION AND RESEARCHER MOBILITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's research collaborations and joint doctoral training activities and how the RC has promoted researcher mobility.

The CNC collaboration network involves specialists from, e.g., psychology, clinical neurophysiology, neurology, pediatrics, psychiatry, medical genetics, phonetics, logopedics, physics, educational science, biology, biomedicine, musicology, and music therapy. The collaboration was also formalized in European research consortia: Braintuning on the mental and neural architecture of music preferences and emotions (coordinated by Prof. Tervaniemi in 2006-2009; www.braintuning.fi) and currently PANS – Probing the auditory novelty system (Prof. Tervaniemi's group as a partner, coordinated by Prof. Escera, University of Barcelona).



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In Finland, the main collaborators are groups/researchers from the Universities of Helsinki, Jyväskylä, Oulu, and Turku, the Aalto University, the Åbo Akademi University, the Sibelius Academy, the Helsinki University Central Hospital (HUCH), and the Finnish Institute of Occupational Health.

Internationally, the main collaborators are as follows:

Norway: Dept. Biological and Medical Psychology, Univ. Bergen

Denmark: Dept. Neuroscience and Pharmacology, Univ. Copenhagen; Center for Functionally Integrative Neuroscience, Aarhus Univ.

Sweden: Dept. Speech Music and Hearing, KTH Royal Institute of Technology, Stockholm; Dept. Philosophy, Cognitive Science, and Dept. Pediatrics, Lund Univ.

Germany: Dept. Psychology, Univ. Leipzig; Experimental Psychology Unit, Helmut Schmidt Univ. /Univ. of the Federal Armed Forces Hamburg; Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig

UK: Medical Research Council, CBU, Cambridge; Dept. Psychiatry, Univ. Oxford

Italy: Dept. Psychiatric and Neurological Sciences, Univ. Bari; Interdisciplinary Speech and Language Research Centre, Univ. Salento, Lecce

Hungary: Institute of Psychology, Hungarian Academy of Sciences, Budapest

Spain: Dept. Psychiatry and Clinical Psychobiology, Univ. Barcelona

France : Institut de Neurosciences Cognitives de la Méditerranée, Marseille

The Netherlands: Dept. Marketing, Tilburg Univ., Tilburg

Russia: Institute of the Human Brain, Russian Academy of Sciences, St. Petersburg

USA: Robert H. Smith School of Business, Univ. Maryland; Dept. Neurology, Univ. California at Davis; Albert Einstein College of Medicine, Bronx, New York

Canada: BRAMS laboratory, the Univ. Montreal and McGill University, Montreal

This network has given outstanding prospects for addressing issues such as effects of language background on audition (cross-linguistic studies with Profs. Schröger (Leipzig) and Besson (Marseille) and their groups) or the nature and nurture effects on the neural basis of behavior (with Prof. Kaprio (Helsinki) with a large twin cohort). Doctoral students are involved in the large majority of the studies of CNC, thereby benefitting from the network. In 2005-2010, the students also have made longer (a few weeks or more) research visits to collaborating laboratories (e.g., BRAMS laboratory, CNRS-UMR 5020, the Tilburg University, the Lund University). Of the 13 CNC PhD theses approved in 2005-2010, 7 included 1-4 articles with a senior international co-author. Doctoral training is further facilitated by international contacts due to the membership in an Erasmus Mundus training network (www.uni-leipzig.de/~acn) since 2010.

- RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

The quantity and quality of collaborators is clearly a strength of CNC, promoting a diversity of research questions touching various areas of human cognition, such as experience and learning, and effects of cultural and language background on perception and cognition, or impairments of these functions. In doctoral training, the students' involvement in these collaborative projects gives them a valuable opportunity to learn from experts of various fields with common interest in neuroscience. This supports both their scientific and creative thinking and formation of international connections of major



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significance for their scientific career. CNC also invites leading scientists from neuroscience and related fields to give talks and promote new collaboration projects, enhancing interaction of doctoral students with scientists from other laboratories. However, although the students and researchers of CNC visit other laboratories, this type of activity should be increased in the future. The personnel will be encouraged to make more such visits, and funds will be acquired for this purpose.

5 OPERATIONAL CONDITIONS (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).

CNC has in its use all central research methods for investigating brain activity, autonomic nervous system and behavioral reactions. This versatility is vital for acquiring novel information on complicated cognitive functions, such as language or music processes, or networks subserving attention, focus areas of CNC research. Furthermore, this well-equipped research environment is optimal for educating internationally competitive scientists. To this end, CNC offers both theoretical and practical (hands-on) methodology courses and individual guidance for doctoral students.

CNC researchers are actively using, in addition to the devices available at our Institute, the neuroimaging devices of the Helsinki Metropolitan Area: fMRI and NIRS at the Aalto University and MEG (a helmet-shaped device and a flat-bottom device suitable also for fetal neuroimaging) at the BioMag Laboratory, HUCH. Also PET at the Institute of the Human Brain in St. Petersburg has been used in CNC research. CNC seniors also participate in the development and maintenance of the neuroimaging infrastructure in the Helsinki Metropolitan Area. For example, Prof. Alho has served as the board member of the AMI Center in 2005-2010 and Prof. Kujala as the board member of BioMag Laboratory since 2008.

The CNC senior scientists have acquired the following research devices to their Institute: high-resolution EEG systems (Biosemi ActiveTwo, 256 channels, Neuroscan Synamps2, 64 channels) and portable EEG systems (BrainProducts QuickAmp), versatile for, for example, bed-side patient recordings or effective collection of large data sets at schools. The ActiveTwo system includes autonomic nervous system sensors, essential for recording emotional reactions. A remote eye-tracker (RED250, SensoMotoric Instruments) exists for measuring eye movements. This system is compatible for concurrent high-density EEG or MEG signal recording because its temporal resolution (250 Hz) corresponds to typical EEG sampling rate. With a research grant acquired in 2010, the CNC will purchase a modern navigated rapid rate TMS system (with combined EEG) with which accurate and detailed maps of cortical functions can be created. With this device, precise cortical areas can be excited or inhibited using stereotactic MRI-guided stimulation. Having all important devices to directly investigate the actual neural processes makes the CNC a unique neuroscientific research center which attracts visitors and collaborators.

A new, up-to-date 3-T fMRI scanner will be bought to the AMI Center of the Aalto University in 2011. This scanner will be jointly funded by the Aalto University, the University of Helsinki and Academy of Finland as a result of a successful joint application in 2010 by Dr. Simo Vanni, the Director of AMI Center, and Prof. Alho.

While CNC researchers can be satisfied with the selection of methods, some other aspects in the operational conditions are not that optimal. For example, the balance between research vs. teaching and administrative duties is clearly not optimal for some of the CNC senior researchers. Some of the professors are overwhelmed with B.A. and M.A. level teaching and with administrative duties, which are a major obstacle for their post-graduate supervision and scientific work.



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- RC's strengths and challenges related to operational conditions, and the actions planned for their development.

The versatility and availability of all central brain research and other methods for investigating human cognitive functions, as well as expertise in using these methods, is a true strength for CNC. Both the laboratories at our own campus and the other laboratories available for us in the Helsinki Metropolitan Area make the research environment ideal for a cognitive neuroscientist. This clearly is a great advantage both for implementing research and teaching new methodologically-skilled generations of scientists. An obstacle for carrying out cutting-edge research, especially longitudinal projects, is the short-term nature of research funding. Project grants are usually for 3-4 years only, making e.g., longitudinal paradigms risky to establish despite their unique affordances in educational and clinical studies. Another problem is the strong emphasis in doctoral training in CNC with too few post-doctoral researcher positions. This consumes the time resources the senior scientists can allocate to directing research projects and concentrating in theoretical work.

6 LEADERSHIP AND MANAGEMENT IN THE RESEARCHER COMMUNITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the execution and processes of leadership in the RC, how the management-related responsibilities and roles are distributed in the RC and how the leadership- and management-related processes support high quality research, collaboration between principal investigators and other researchers in the RC, the RC's research focus and strengthening of the RC's know-how.

CNC is organized into research groups, each led by a Professor. These groups form synergetic thematic modules with research interests in separate but overlapping focus areas. The groups of Profs. Kujala, Tervaniemi, and Näätänen, belonging to Cognitive Brain Reserch Unit (CBRU), primarily investigate diverse aspects of auditory cognition. Prof. Kujala's group has its main research interests in neural networks underlying language perception and their deficits, as well as in neural plasticity of language processes. Prof. Tervaniemi's team focuses on investigating the neural mechanisms of auditory cognition, music emotion and preferences, and music skill learning. Prof. Näätänen's group aims at determining the effects of aging on the different aspects of central auditory processing such as speech perception and understanding. Prof. Alho's Attention and Memory Networks (AMN) research group investigates brain networks of attention and memory functions especially within audition. Prof. Krause's research projects investigate the neural and behavioral correlates of human higher level cognitive processes, such as memory and language processes, childhood cognitive development, spatial cognition, and visual perception.

These groups are the main users of the neurophysiological laboratories located at the Institute of Behavioural Sciences. The management and rules of laboratory use are created and implemented by the professors and other seniors of CNC, who have regular meetings. The management involves issues, such as the facilities of the laboratory, the laboratory reservation system, and the applications to the ethical committee. Generally, in decision making, also the opinions and arguments of the rest of the personnel, including post graduate students, are taken into account.

In CNC personnel management, the leading idea is equality between genders and nationalities. During 2005-2010, 9 foreign researchers have belonged to the personnel of CNC and several foreigners have stayed as collaborating visitors. CNC promotes female careers judging from the female-male ratio, the percentage of females being 76 % for all research personnel and 75 % for professors. This largely contrasts the typical situation at Finnish universities. For instance, the overall proportion of female professors at the University of Helsinki is less than 35 %.



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RC-SPECIFIC STAGE 2 MATERIAL

Welfare at work is promoted in CNC by encouraging the personnel to have a good balance between their work and personal life. Mentors and supervisors remind the personnel about the importance of this issue both for personal well-being and for managing the demanding tasks at work. Well-being at work and cohesion between the members of the personnel are supported with common activities, such as the annually-organized day in Spring when everybody contributes to improving the working environment, followed by a picnic together. In the end of the year, a Christmas seminar and party is arranged. Additionally, great achievements, such as publications in high-ranking journals are celebrated together.

- RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes.

One of CNC's strengths in management is a well-structured organization with 4 research groups, each led by a professor, having different but synergetic research focuses. This way the most important areas of human cognition (memory, attention, language and music processes, and their evolution from infancy to the old age) are covered. This division to smaller groups is, in our experience, an excellent solution, since small groups are agile, quick in decisions and actions, and more interactive than large groups. One problem of CNC is the low ratio between post-doctoral researchers and doctoral students. Another major challenge is that the Director and laboratory engineer posts of CBRU are not permanent. This and the fragmented research funds which are acquired for short-term periods from external sources endanger the long-term stability and development of the laboratory.

7 EXTERNAL COMPETITIVE FUNDING OF THE RC

- Listing of the RCs external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- Academy of Finland (AF) - total amount of funding (in euros) AF has decided to allocate to the RC members during 1.1.2005-31.12.2010: 3890000
- Finnish Funding Agency for Technology and Innovation (TEKES) - total amount of funding (in euros) TEKES has decided to allocate to the RC members during 1.1.2005-31.12.2010: 346000
- European Union (EU) - total amount of funding (in euros) EU has decided to allocate to the RC members during 1.1.2005-31.12.2010: 2620000
- European Research Council (ERC) - total amount of funding (in euros) ERC has decided to allocate to the RC members during 1.1.2005-31.12.2010:
- International and national foundations – names of international and national foundations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the foundations: Helsingin Sanomain Säätiö
 - total amount of funding (in euros) from the above-mentioned foundations: 250000
- Other international funding - names of other international funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).



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- names of the funding organizations: Nordic Center of Excellence, Philips Nordic Prize 2007 for research within neurodevelopmental disorders, Erasmus Mundus Student Exchange Network in Auditory Cognitive Neuroscience
- total amount of funding (in euros) from the above-mentioned funding organizations: 146000
- Other national funding (incl. EVO funding and Ministry of Education and Culture funded doctoral programme positions) - names of other national funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: Graduate School of Psychology, Graduate School Functional Imaging in Medicine, CIMO, Finnish Work Environment Fund, National Doctoral Programme of Psychology, Suomen Kulttuurirahasto, University of Helsinki
 - total amount of funding (in euros) from the above-mentioned funding organizations: 1711000

8 RC'S STRATEGIC ACTION PLAN FOR 2011–2013 (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's future perspectives in respect to research and doctoral training.

During 2011-2013, CNC will especially focus on clinical and learning research, while still continuing with systematic basic research on audition and crossmodal processing, attention, and memory. CNC aims at combining more effectively the variety of brain-research methods to get a more detailed picture on the spatiotemporal dynamics of brain processes. To this end it will, for example, provide even more extensively than before hands-on methods courses for doctoral students and recruit post-doctoral researchers with good neuroimaging analysis skills. New main directions of CNC research are as follows:

- We will determine the benefits of using learning technology and virtual environments in facilitating foreign language learning and supporting language skills of language impaired children. Neural correlates of learning-induced changes will be defined with brain imaging. This aim is supported by the collaboration of CNC and CICERO Learning Network directed by Prof. Alho in 2009-2010. Prof. Kujala has recently been appointed to the Professorship Brain, Learning and Education of CICERO Learning Network for 2011-2016. Moreover, Prof. Kujala belongs to the Language and Literacy Network of Excellence (directed by Prof. Heikki Lyytinen, University of Jyväskylä) providing an international learning research community advancing studies on neural plasticity of learning.

- We will study brain activity during audio-visual dual tasks to find the bottlenecks making such tasks difficult and to study changes in brain activity, e.g., in prefrontal, parietal and modality-specific cortical areas, associated with learning to perform two tasks in parallel.

- In the context of Center of Excellence in Interdisciplinary Music Research (2008-2013), the effectiveness of various forms of music listening therapy are systematically compared. Also the physiological concomitants of music listening in healthy musically non-trained individuals will be further investigated by means of endocrinological analyses and recordings of the autonomic nervous system reactions. In parallel, we will complete investigations on music skill development in two different longitudinal paradigms and the existence of transfer effects from music to language skills.

CNC has been able to acquire funding from a variety of sources, the total estimated amount of funding being over 10.5 million Euros in 2005-2010 when all competed funding outside the university budget funding is taken into account. While continuing to utilize the variety of current funding sources, we will also systematically apply for large research grants from the European Research Council, European Science Foundation, European Commission Programmes (research projects and training networks),



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RC-SPECIFIC STAGE 2 MATERIAL

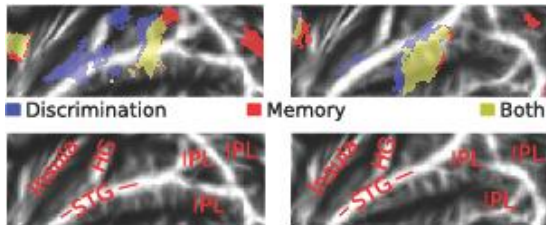
Finland Distinguished Professor Programme, Center of Excellence and Academy Professor Programs of the Academy of Finland.

The main aims of doctoral training are to make the doctoral studies more uniform, to increase collaboration in doctoral training in the Helsinki Metropolitan Area (with Aalto University, HUCH, and the Neuroscience Center at University of Helsinki), and to increase and systematize methodological teaching. Currently, the doctoral studies are tailored for each student, which is time consuming both for the student and mentors. We will create a more unified, while still flexible, program for doctoral studies, aiming at establishing Helsinki Doctoral Program in Cognitive Neuroscience.

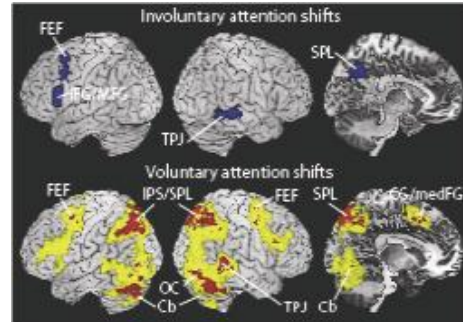
9 SHORT DESCRIPTION OF HOW THE RC MEMBERS HAVE CONTRIBUTED TO THE COMPILATION OF THE STAGE 2 MATERIALS (MAX. 1100 CHARACTERS WITH SPACES).

Each researcher currently working in CNC has created his/her personal web page including information on publications and other activities, from which the information is compiled for the research evaluation. They were instructed to focus on those activities which will be included in the evaluation due to the short time period during which this had to be carried out. For the current form, each professor has collected the material and information from his/her own research group. The professors have also had meetings to plan the coordination of this work and to prepare the strategic plan for next years. They all also contributed to writing and editing the text of this form. In addition, they selected data figures for the Figure Appendix from the publications which represent their work.

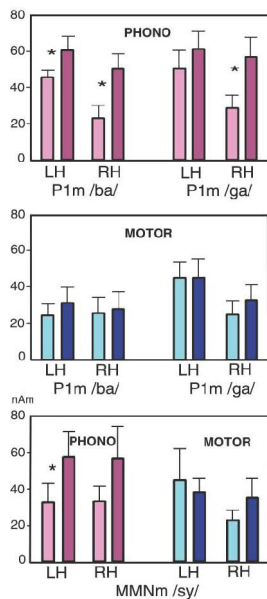
Figure Appendix 1 Cognitive Neuroscience Cluster, Teija Kujala



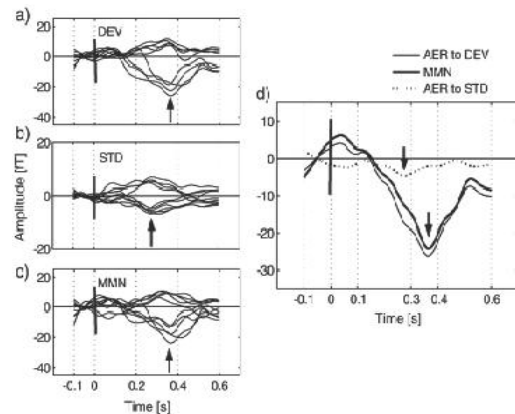
Top row: areas in the left and right auditory cortices (the left and right column, respectively) showing enhanced activity during auditory pitch-discrimination (blue) or pitch-memory tasks (red) or both (yellow). fMRI data from 17 participants projected on flattened mean cortical anatomy enabling estimation of activity distributions in gyri (white areas) and sulci (black areas). Bottom row: A guide for anatomical structures. HG = Heschl's gyrus, STG = superior temporal gyrus, IPL = inferior parietal lobe. Figure adapted from Rinne et al., *J. Neurosci.*, 2009.



Brain areas showing enhanced activity associated with involuntary shifts of attention to task-irrelevant louder sounds (top row, blue areas) and with voluntary shifts of attention (guided by a foveal visual arrow cue) from a left-ear sound stream to the right-ear stream, or vice versa (bottom row, yellow and red areas). fMRI data from 19 participants. Note the overlap of brain areas activated by the two types of auditory attention. TPJ = temporo-parietal junction, SPL = superior parietal lobe, IPS = intraparietal sulcus, FEF = frontal eye field, IFG/MFG = inferior/middle frontal gyrus, CG/medFG = cingulate/medial frontal gyrus, OC = occipital cortex, Cb = Cerebellum. Figure adapted from Salmi et al., *Brain Res.*, 2009.

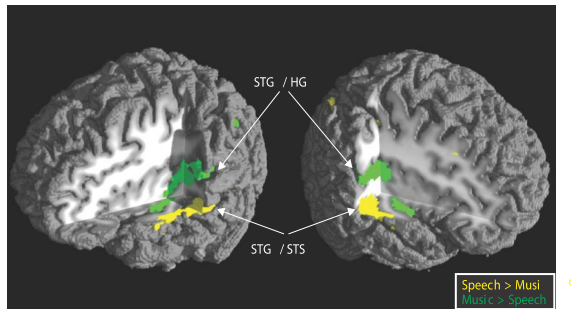


Language-impaired 5-year-old children had either language exercises (Phono group) or motor exercises (Motor group). MEG recordings showed enhanced neural activity for speech sounds after language intervention (red bars; significant change marked with an asterisk) but not after motor exercises (blue bars). These plastic neural changes concerned both neural encoding (P1m) and discrimination (MMN) of speech sounds. Figure adapted from Pihko et al., *Cer. Cor.*, 2007.

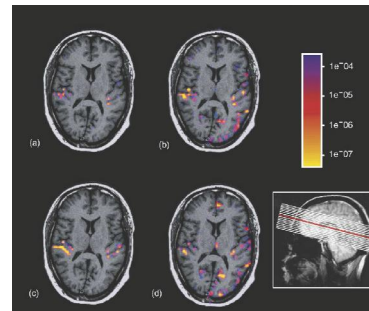


Auditory evoked magnetic fields were recorded with MEG from fetuses at 33 week gestational age for repetitive sounds and occasional pitch changes. Here, responses are shown from one representative fetus for: (a) pitch changes, (b) repetitive sounds, and (c) a subtraction of these responses showing the MMN indicating that the fetus' brain could discriminate the sounds from one another. In (d) responses from a representative channel for the two sound types and their subtraction are shown. Figure adapted from Draganova et al., *NeuroIm.*, 2007.

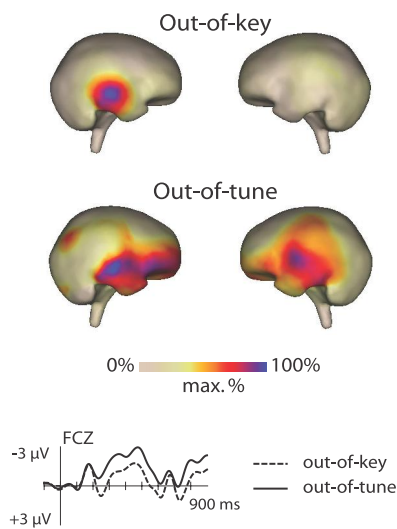
Figure Appendix 2 Cognitive Neuroscience Cluster, Teija Kujala



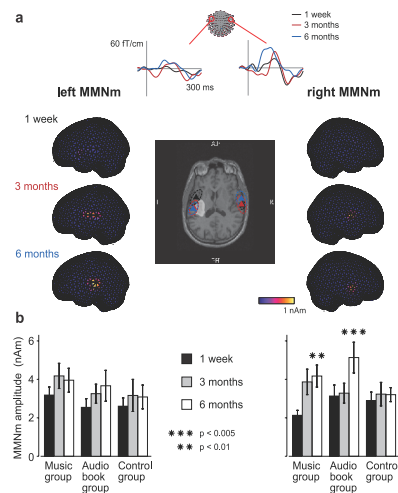
Comparison of BOLD activity caused by speech vs. music sounds. Pseudowords activated the inferior part of the lateral STG more than saxophone sounds while saxophone sounds activated the superior/medial surface of the STG/HG more than pseudoword sounds did. Additional frontal activation was observed for speech sounds in the middle frontal gyrus. Adapted from Tervaniemi et al., *J. Neurosci.*, 2006.



fMRI shows occipital cortex activity in blind individuals during auditory tasks (data of a representative subject shown here). This activity was found during tasks requiring attentive sound-change detection (b, d) but not when attention was directed away from the sound features (c) or when the stimulation was monotonous (a). The results suggest that the occipital cortex of the blind participates in attentive detection of novel sounds. Figure adapted from Kujala et al., *Neurosci. Lett.*, 2005.



MMN brain responses elicited by incongruities within melodies while musically untrained participants were watching a silent movie. Bottom panel: Dashed line indicates the MMN for out-of-key incongruities and continuous line the MMN for out-of-tune incongruities. Upper and middle panel: Minimum current modeled activation indicating the strength of the cortical activity. Both in-key and out-of-key violations activated mainly right-hemispheric secondary auditory cortices. Adapted from Brattico et al., *Brain Res.*, 2006.



MMNm elicited by a frequency change in stroke patients 1 week, 3 months and 6 months post-stroke. a) Case example of a stroke patient with changes in MMNm shown from individual MEG channels and with Minimum Current Estimation (MCE) models. The MRI image depicts the location of the lesion (white) as well as the region of interest (ellipsoids) used in the MCE model. (b) Group results (mean \pm SEM) indicating that the right hemisphere MMNm amplitude increased more in patients who listened daily to music ($n = 18$) or audio books ($n = 19$) than in control group ($n = 17$) patients. Adapted from Särkämö et al., *J. Cogn Neurosci*, 2010.



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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CNC/Kujala

1 Analysis of publications

- Associated person is one of Elvira Brattico , Minna Huotilainen , Eva Istok , Eira Maria
Margaret Jansson-Verkasalo, Sini Maria Koskinen , Milena Korostenskaja, Kaisu Ilona Krohn , Teija Margit Kujala ,
Soila Kuuluvainen , Maria Mittag , Hanna-Mari Mäki-Karjalainen, Tuulia Lepistö ,
Riikka Lindström , Riikka Katriina Lovio , Risto Näätänen ,
Daria Osipova, Petri Paavilainen , Satu Pakarinen , Eino Partanen ,
Vesa Juhani Putkinen , Pia Erika Ory , Anna Shestakova ,
Mia Silvia Anneli Seppänen , Veerle Simoens , Petteri Simola , Teppo Särkämö ,
Rika Takegata , Tuomas Olavi Teinonen , Mari Tervaniemi ,
Kuula-Paavola , Ritva Torppa , Sari Pauliina Ylinen , Christina Krause , Liisa
Alina Leminen , Mirka Johanna Pesonen ,
Alexander Sten Degerman, Siiri Paula Kaarina Kirjavainen , Sonja Maria Koistinen ,
Anu Mari Kujala , Teemu Rinne , Juha Salmitaival , Emma Ailisa Salo ,

Publication type	Publication Year						Total Count 2005 - 2010
	2005	2006	2007	2008	2009	2010	
A1 Refereed journal article	35	33	39	26	38	33	204
A2 Review in scientific journal	1		4	1	8	3	17
A3 Contribution to book/other compilations (refereed)	1	8	1		6	9	25
A4 Article in conference publication (refereed)	2		1		2	1	6
B1 Unrefereed journal article	3	4	1		8	1	17
B3 Unrefereed article in conference proceedings				1	1	1	3
D1 Article in professional journal	1					1	2
D2 Article in professional hand or guide book or in a professional data system, or text book material						1	1
D3 Article in professional conference proceedings					1		1
D5 Text book or professional handbook or guidebook or dictionary		2	2		4		8
E1 Popular article, newspaper article		2	1		3	3	9
E1 Popular contribution to book/other compilations	1						1



CNC/Kujala

2 Listing of publications

A1 Refereed journal article

2005

- Brattico, E, Kujala, T, Tervaniemi, M, Alku, P, Ambrosi, L, Monitillo, V **2005**, 'Long-term exposure to occupational noise alters the cortical organization of sound processing', **Clinical Neurophysiology**, vol 116, no. 1, pp. 190-203.
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- Kujala, T, Palva, MJ, Salonen, O, Alku, P, Huotilainen, M, Järvinen, A, Nääätänen, R **2005**, 'The role of blind humans' visual cortex in auditory change detection', **Neuroscience Letters**, vol 379, no. 2, pp. 127-131.
- Kujala, T, Lepistö, T, Nieminen-von Wendt, T, Nääätänen, P, Nääätänen, R **2005**, 'Neurophysiological evidence for cortical discrimination impairment of prosody in Asperger syndrome', **Neuroscience Letters**, vol 383, no. 3, pp. 260-265.
- Lachmann, T, Berti, S, Kujala, T, Schröger, E **2005**, 'Diagnostic subgroups of developmental dyslexia have different deficits in neural processing of tones and phonemes', **International Journal of Psychophysiology**, vol 56, no. 2, pp. 105-120.
- Lepistö, T, Kujala, T, Vanhala, R, Alku, P, Huotilainen, M, Nääätänen, R **2005**, 'The discrimination of and orienting to speech and non-speech sounds in children with autism', **Brain Research : international multidisciplinary journal devoted to fundamental research in the brain sciences**, vol 1066, pp. 147-157.
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- Pallesen, KJ, Brattico, E, Bailey, C, Korvenoja, A, Koivisto, J, Gjedde, A, Carlson, S **2005**, 'Emotion processing of major, minor, and dissonant chords - A functional magnetic resonance imaging study', **Annals of the New York Academy of Sciences**, vol 1060, pp. 450-453.
- Palolahti, M, Leino, S, Jokela, M, Kopra, K, Paavilainen, P **2005**, 'Event-related potentials suggest early interaction between syntax and semantics during on-line sentence comprehension', **Neuroscience Letters**, vol 384, no. 3, pp. 222-227.
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UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CNC/Kujala

- Pihko, E, Kujala, T, Mickos, A, Antell, H, Alku, P, Byring, R, Korkman, M 2005, 'Magnetic fields evoked by speech sounds in preschool children', **Clinical Neurophysiology**, vol 116, no. 1, pp. 112-119.
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Peretz, I, Brattico, E, Tervaniemi, M, Moreau, P 2010, 'Activité électrophysiologique anormale en réponse à des différences de hauteurs chez les amusiques congénitales', in R Kolinski, J Morais, I Peretz (eds), **Musique, langage, émotion. approche neuro-cognitive: approche neuro-cognitive., Presses Universitaires de Rennes, Rennes**, pp. 111-119.

Särkämö, T, Tervaniemi, M 2010, 'Musiikin ja puheen suhde', in P Korpiolahti, O Aaltonen, M Laine (eds), **Kieli ja aivot. kommunikaation perusteet, häiriöt ja kuntoutus., Kognitiivisen neurotieteen tutkimuskeskus, Turun yliopisto, Turku**, pp. 43-50.

Tervaniemi, M 2010, 'Musiikki ja muusikkous aivoissamme', in J Louhivuori, S Saarikallio (eds), **Musiikkipsykologia, Atena, Jyväskylä**, pp. 57-63.

A4 Article in conference publication (refereed)

2005

Brattico, E, Kuusi, T, Tervaniemi, M 2005, 'Brain mechanisms of musical chord categorization are modulated by expertise', in **Proceedings of the 17th Annual Conference of the Cognitive Science Society (CogSci)**.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CNC/Kujala

Kotilahti, K, Nissilä, I, Mäkelä, R, Noponen, T, Lipiäinen, L, Gavrielides, N, Kajava, T, Huotilainen, M, Fellman, V, Meriläinen, P, Katila, T 2005, 'Near-infrared spectroscopic imaging of stimulus-related hemodynamic responses on the neonatal auditory cortices', in **Proceedings of the International Society for Optical Engineering: Optical Tomography and Spectroscopy of Tissue VI (Proceedings Volume)**, pp. 388-95.

2007

Tervaniemi, M 2007, 'Cortical processing of music sounds', in **Music meets medicine: the XXI Signe and Ane Gyllenberg Symposium, Hanasaari Congress Center, September 20-22, 2007**, pp. 158-168 *Acta Gyllenbergiana*, no. 7.

2009

Garza Villarreal, EA, Brattico, E, Leino, S, Østergaard, L, Vuust, P 2009, 'Harmony wants to sit in the front: Different brain responses to violations in chord progressions', in **Proceedings of the 7th Triennial Conference of European Society for the Cognitive Sciences of Music: ESCOM 2009: 12-16 August 2009, Jyväskylä, Finland**, pp. 147-153.

Seppänen, M, Henttonen, P, Tervaniemi, M 2009, 'Do physiological responses and personality traits relate to auditory perceptual learning in musicians and non-musicians?', in **Proceedings of the 7th Triennial Conference of European Society for the Cognitive Sciences of Music (ESCOM 2009) Jyväskylä, Finland**, pp. 491-494.

2010

Torppa, R, Faulkner, A, Vainio, M, Järvikivi, J 2010, 'Acquisition of focus by normal hearing and Cochlear implanted children: The role of musical experience', in **Proceedings of the 5th International Conference on Speech Prosody**.

B1 Unrefereed journal article

2005

Alho, K, Saarinen, J 2005, 'Kognitiivinen psykologia ja neurotiede: havaitseminen, tarkkaavaisuus ja oppiminen kahdesta eri näkökulmasta', **Psykologia**, vol 40, no. 3, pp. 300-306.

Alho, K 2005, 'Monitieteinen aivotutkimus', **Tieteessä tapahtuu**, vol 23, no. 6, pp. 10-14.

Tran, D, Bachman, P, Kim, J, Glahn, DC, Therman, S, Manninen, M, Huttunen, M, Lönnqvist, J, Kaprio, J, Näätänen, R, Konotchick, T, Quintero, M, Cannon, TD 2005, 'Resting EEG power in schizophrenia patients, their non-schizophrenic cotwins, and control twins: [Abstract of the XX International congress on Schizophrenia Research]', **Schizophrenia bulletin**, vol 31, no. 2, pp. 465-465.

2006

Bachman, P, Kim, J, Yee-Bradbury, CM, Therman, S, Manninen, M, Lönnqvist, J, Kaprio, J, Näätänen, R, Cannon, TD 2006, 'Two tests of neural efficiency in schizophrenia patients performing a working memory task: [Poster Session Abstract]', **Psychophysiology**, vol 43, no. Supplement s1, pp. S21-S22.

Brattico, E 2006, 'Isabelle Peretz and Robert Zatorre (eds), The cognitive neuroscience of music: Book Review', **Musicae Scientiae**, vol 10, no. 1, pp. 130-137.

Campbell, T, Osipova, D, Kähkönen, S 2006, 'Finland's Galapagos: founder effect, drift and isolation in the inheritance of susceptibility alleles: [commentary]', **Behavioral and Brain Sciences**, vol 29, no. 4, pp. 409410.

Krause, CM 2006, 'Aivojen sähköinen taustatoiminta ja kognitiiviset prosessit', **Tieteessä tapahtuu**, vol 24, no. 2, pp. 10-15.

2007

Alho, K 2007, 'Hajun, maun ja flavorin psykologiaa', **Psykologia**, vol 42, no. 4, pp. 314-317.

2009

Alho, K 2009, 'Mikä tekee aivotutkimuksesta psykologisesti mielekästä?', **Psykologia**, vol 44, no. 3, pp. 214-215.

Korostenskaja, M, Dapsys, K, Siurkute, A, Dudlauskaitė, A, Pragaravičienė, A, Maciulis, V, Kähkönen, S 2009, 'P03-132: The effect of quetiapine on auditory P300 response in patients with schizoaffective disorder: preliminary study', **European Psychiatry**, vol 24, no. Supplement 1, pp. S1131.

Krause, CM 2009, 'Psykologian historiaa amerikkalaisesta näkökulmasta', **Psykologia**, vol 44, no. 5-6, pp. 448-449.

Krause, CM 2009, 'Mikä tekee psykologiasta psykologian', **Psykologia**, vol 44, no. 5-6, pp. 418-419.

Numminen, A, Erkkilä, J, Huotilainen, M, Lonka, K 2009, 'Musiikki hyvinvoinnin evoluutiossa: aivot, mieli ja yhteisö', **Tieteessä tapahtuu**, vol 27, no. 6, pp. 10-15.

Seppänen, M, Svedholm, A 2009, 'Väitöskirjatutkijaa uuvuttaa yhteisöllisyyden ja tuen puute', **Psykologia**, vol 44, no. 3, pp. 208-210.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CNC/Kujala

Särkämö, T, Laitinen, S **2009**, 'Yhdessä laulaen ja musiikkia kuunnellen muistojen ja muistin elpymistä', **Muisti**, vol 22, no. 3, pp. 30-31.

Tervaniemi, M **2009**, 'Part V Introduction: Emotions and music: normal and disordered development', **Annals of the New York Academy of Sciences**, vol 1169, pp. 295-296.

2010

Alho, K **2010**, 'Sosiaalista neurotiedettä popularisoiden', **Tieteessä tapahtuu**, vol 28, no. 1, pp. 45-47.

B3 Unrefereed article in conference proceedings

2008

Istok, E, Tervaniemi, M, Friberg, A, Seifert, U **2008**, 'Effects of timing cues in music performances on auditory grouping and pleasantness judgments.', in **Proceedings of the 10th International Conference of Music Perception and Cognition (ICMPC10)**, Sapporo, Japan.

2009

Heinonen, SM, Vainio, O, Krause, CM, Törnqvist, H, Palviainen, M, Hänninen, L, Pastell, M **2009**, 'Examining Canine Mind with EEG and Eye Tracking', in **CICERO Learning Mind and Brain Conference 2009**.

2010

Somppi, SM, Törnqvist, H, Hänninen, L, Vainio, O, Krause, CM **2010**, 'Dogs do look at images - Eye tracking in canine cognition research', in **The 2nd Canine Science Forum 25-28 July, Vienna, Austria: On dogs and related Canids: from genes through behavior to society**, pp. 173.

D1 Article in professional journal

2005

Koskinen, SM **2005**, 'Alkoholi vaikuttaa nuorten aivoihin', **Terveystieteiden aikakauslehti**, no. 7, pp. 26-27.

2010

Torppa, R **2010**, 'Musiikki puheterapeutin voimavarana', **Puheterapeutti**, vol 10, no. 1, pp. 16-19.

D2 Article in professional hand or guide book or in a professional data system, or text book material

2010

Särkämö, T **2010**, 'Musiikkia aivoille: Miten musiikki vaikuttaa aivojen toimintaan?', in J Varho, M Lehtovirta (eds), **Taidetta ikä kaikki. Selvitys ikäihmisten hoivayhteisöjen kulttuuritoiminnasta Helsingissä.**, Helsingin kulttuurikeskus, Helsinki, pp. 28-29.

D3 Article in professional conference proceedings

2009

Mittag, M, Takegata, R, Kujala, T **2009**, 'The effects of temporal synchrony and visual material on audio-visual integration', in **Frontiers Human Neuroscience Conference Abstract: MMN 09 Fifth Conference on Mismatch Negativity (MMN) and its Clinical and Scientific Applications**.

D5 Text book or professional handbook or guidebook or dictionary

2006

Paavilainen, P, Kalakoski, V, Laarni, J **2006**, *Persoona 3: Tiedonkäsittelyn perusteet*, Edita, Helsinki.

Torppa, R, Helena, A **2006**, *Pöllö ja poikaset; Näin laulan lapsen kanssa.*, Impi ja Ilmari Lindforsin kuulo- ja kommunikaatiovammaisten lasten ja nuorten tukisäätiö, Helsinki.

2007

Kalakoski, V, Laarni, J, Paavilainen, P **2007**, *Persoona 4: Motivaatio, tunteet ja taitava toiminta*, Edita, Helsinki.



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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CNC/Kujala

Lonka, K, Hakkarainen, K, Huotilainen, M, Ferchen, M, Lautso, A 2007, *Psykologia!: Kurssi 3: Ihmisen tiedonkäsittelyn perusteet, WSOY Oppimateriaalit, Helsinki.*

2009

Torppa, R, Laakso, S, Rocca, C, Bowker, C 2009, *Mukula 3: Kolme pientä porsasta.: Lauaen, leikkien ja soittien musiikkiin ja kieleen., Impi ja Ilmari Lindforsin kuulo- ja kommunikaatiovammaisten lasten ja nuorten tukisäätiö, Helsinki.*

Torppa, R, Laakso, S, Rocca, C, Bowker, C 2009, *Mukula 2: Pelle, Työnnä, työnnä, Pelikaani ja Viisi pientä kalaa.: Kuuntelemalla ja leikkimällä musiikkiin ja kieleen. , Impi ja Ilmari Lindforsin kuulo- ja kommunikaatiovammaisten lasten ja nuorten tukisäätiö, Helsinki.*

Torppa, R, Seija, L, Rocca, C, Bowker, C 2009, *Mukula 4: Kirahvit eivät osaa tanssia.: Lauaen, leikkien, tanssien ja soittien musiikkiin ja kieleen. , Impi ja Ilmari Lindforsin kuulo- ja kommunikaatiovammaisten lasten ja nuorten tukisäätiö, Helsinki.*

Torppa, R, Laakso, S, Rocca, C, Bowker, C 2009, *Mukula 1: Kirje eläintarhaan.: Kuuntelemalla ja leikkimällä musiikkiin ja kieleen., Impi ja Ilmari Lindforsin kuulo- ja kommunikaatiovammaisten lasten ja nuorten tukisäätiö, Helsinki.*

E1 Popular article, newspaper article

2006

Alho, K 2006, 'Yliopistoissa uusille tohtoreille vähän työpaikkoja', *Helsingin Sanomat*, no. 30.11.2006, pp. C 6.

Simoens, V 2006, 'Miksi iho menee kananlihalle, kun kuuntelee hyvää musiikkikappaletta?', *Tiede*, vol 26, no. 6.

2007

Alho, K, Ihanus, J 2007, 'Professori Risto Vuorinen: [neurologi]', *Helsingin Sanomat*, no. 10.01.2007, pp. C 7.

2009

Brattico, E 2009, 'L'obiettivo: guarire gli stonati', *Ok Salute Prima Tutto* , no. 27.10.2009.

Brattico, E 2009, 'Lezioni di musica: Una ginnastica per il cervello', *Ok Salute Prima Tutto* , no. 14.12.2009.

Brattico, E 2009, 'H1N1 I dubbi sul vaccino', *Ok Salute Prima Tutto* , no. 18.11.2009.

2010

Brattico, E 2010, 'Imaging genetics: Bari all'avanguardia', *Ok Salute Prima Tutto* , no. 30.08.2010.

Brattico, E 2010, 'Quell'invito del ministro della Salute', *Ok Salute Prima Tutto* , no. 15.09.2010.

Brattico, E 2010, 'Il (breve) ritorno di un cervello', *Ok Salute Prima Tutto* , no. 30.06.2010.

E1 Popular contribution to book/other compilations

2005

Alho, K 2005, 'Uusia näkymiä ihmisaivoihin', in K Aro (ed.), *Mitä missä milloin 2006. Kansalaisen vuosikirja syyskuu 2004 - elokuu 2005.*, vol. 56, *Otava, Helsinki*, pp. 247-252.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
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RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

CNC/Kujala

1 Analysis of activities 2005-2010

- Associated person is one of Elvira Brattico , Minna Huotilainen , Eva Istok , Eira Maria
Margaret Jansson-Verkasalo, Sini Maria Koskinen , Milena Korostenskaja, Kaisu Ilona Krohn , Teija Margit Kujala ,
Soila Kuuluvainen , Maria Mittag , Hanna-Mari Mäki-Karjalainen, Tuulia Lepistö ,
Riikka Lindström , Riikka Katriina Lovio , Risto Näätänen ,
Daria Osipova, Petri Paavilainen , Satu Pakarinen , Eino Partanen ,
Vesa Juhani Putkinen , Pia Erika Ory , Anna Shestakova ,
Mia Silvia Anneli Seppänen , Veerle Simoens , Petteri Simola , Teppo Särkämö ,
Rika Takegata , Tuomas Olavi Teinonen , Mari Tervaniemi ,
Kuula-Paavola , Ritva Torppa , Sari Pauliina Ylinen , Christina Krause , Liisa
Alina Leminen , Mirka Johanna Pesonen , Kimmo Alho ,
Anu Mari Kujala , Alexander Sten Degerman, Siiri Paula Kaarina Kirjavainen , Sonja Maria Koistinen ,
Teemu Rinne , Juha Salmitaival , Emma Ailisa Salo ,

Activity type	Count
Supervisor or co-supervisor of doctoral thesis	59
Prizes and awards	18
Editor of research journal	8
Peer review of manuscripts	214
Editor of series	2
Editor of special theme number	1
Assessment of candidates for academic posts	34
Membership or other role in review committee	7
Membership or other role in research network	5
Membership or other role in national/international committee, council, board	63
Membership or other role in public Finnish or international organization	14
Participation in interview for written media	84
Participation in radio programme	20
Participation in TV programme	16
Participation in interview for web based media	8



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2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Elvira Brattico ,

Co-supervision of Doctoral Thesis of Eduardo Garza Villareal, completed 2011, Elvira Brattico, 2007 → 2011, Denmark

Co-supervision of Doctoral Thesis of Vinoo Alluri, Elvira Brattico, 2007 → 2011, Finland

Supervision of Doctoral Thesis of Carlos Pereira, Elvira Brattico, 2010 → 2011, Portugal

Supervision of Doctoral Thesis of Tiziana Quarto, Elvira Brattico, 22.11.2010 → 2013, Finland

Minna Huutilainen ,

PhD Anu Kujala / Supervisor of doctoral thesis, Minna Huutilainen, 05.12.2005, Finland

M.Sc. Hanna Hakomäki / Supervisor of doctoral thesis, Minna Huutilainen, 2006 → ..., Finland

PhD Sari Yläinen / Supervisor of doctoral thesis, Minna Huutilainen, 07.07.2006, Finland

M.Sc. Eino Partanen / Supervisor of doctoral thesis, Minna Huutilainen, 2007 → ..., Finland

M.Sc. Vesa Putkinen / Supervisor of doctoral thesis, Minna Huutilainen, 2009 → ..., Finland

PhD Tuomas Teinonen / Supervisor of doctoral thesis, Minna Huutilainen, 12.2009, Finland

M.Sc. Laura Sokka / Supervisor of doctoral thesis, Minna Huutilainen, 2010 → ..., Finland

M.Sc. Ritva Torppa / Supervisor of doctoral thesis, Minna Huutilainen, 2010 → ..., Finland

Teija Margit Kujala ,

Co-supervision of Doctoral Thesis of Sini Koskinen, Teija Margit Kujala, 2005 → ..., Finland

Supervision of Doctoral Thesis of Riikka Lovio, Teija Margit Kujala, 2005 → ..., Finland

Supervision of Doctoral Thesis of Titta-Maria Ilvonen, completed 2006, Teija Margit Kujala, 2006, Finland

Supervision of Doctoral Thesis of Maria Mittag, Teija Margit Kujala, 2007 → ..., Finland

Supervision of Doctoral Thesis of Hanna-Mari Mäki-Karjalainen, Teija Margit Kujala, 2008 → ..., Finland

Supervision of Doctoral Thesis of Riikka Lindström, Teija Margit Kujala, 2008 → ..., Finland

Supervision of Doctoral Thesis of Tuulia Lepistö, completed 2008, Teija Margit Kujala, 2008, Finland

Co-supervision of Doctoral Thesis of Elina Niemitalo-Haapola, Teija Margit Kujala, 2009 → ..., Finland

Co-supervision of Doctoral Thesis of Petteri Simola, Teija Margit Kujala, 2009 → ..., Finland

Supervision of Doctoral Thesis of Soila Kuuluvainen, Teija Margit Kujala, 2009 → ..., Finland

Co-supervision of Doctoral Thesis of Sini Lapinlampi, Teija Margit Kujala, 2010, Finland

Risto Näätänen ,

Co-supervision of Doctoral Thesis of Riikka Lovio, Risto Näätänen, 2005 → ..., Finland

Supervision of Doctoral Thesis of Valentina Gumenyuk, completed 2005, Risto Näätänen, 2005, Finland

Supervision of Doctoral Thesis of Anu Kujala, completed 2006, Risto Näätänen, 2006, Finland

Supervision of Doctoral Thesis of Elvira Brattico, completed 2006, Risto Näätänen, 2006, Finland

Supervision of Doctoral Thesis of Titta-Maria Ilvonen, completed 2006, Risto Näätänen, 2006, Finland

Supervision of Doctoral Thesis of Reinis Lazda, Risto Näätänen, 09.2007 → ..., Estonia

Supervision of Doctoral Thesis of Satu Palva, completed 2007, Risto Näätänen, 2007, Finland

Supervision of Doctoral Thesis of Satu Pakarinen, Risto Näätänen, 2008 → ..., Finland

Supervision of Doctoral Thesis of Tuulia Lepistö, completed 2008, Risto Näätänen, 2008, Finland

Supervision of Doctoral Thesis of Maria Tamm, Risto Näätänen, 2009 → ..., Estonia

Supervision of Doctoral Thesis of Nele Kuldsepp, Risto Näätänen, 2009 → ..., Estonia



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CNC/Kujala

Teppo Särkämö ,

Co-supervisor, PhD thesis, Teppo Särkämö, 2010 → ..., Finland

Rika Takegata ,

Supervision of PhD student, Rika Takegata, 01.06.2007 → 31.12.2011

Mari Tervaniemi ,

Co-supervision of PhD theses, Mari Tervaniemi, 2002 → 2006, Finland

Co-supervision of PhD theses, Mari Tervaniemi, 2002 → 2006, Finland

Co-supervision of PhD theses, Mari Tervaniemi, 2002 → 2006, Finland

Co-supervision of PhD theses, Mari Tervaniemi, 01.2003 → 11.2009, Finland

Co-supervision of PhD theses, Mari Tervaniemi, 2005 → 2010

Co-supervision of PhD theses, Mari Tervaniemi, 2005 → 2010

Co-supervision of PhD theses, Mari Tervaniemi, 2005 → 2010

Co-supervision of PhD theses, Mari Tervaniemi, 2005 → 2010

Co-supervision of PhD theses, Mari Tervaniemi, 2006 → 2010

Co-supervision of PhD theses, Mari Tervaniemi, 2008 → 2010

Co-supervision of PhD theses, Mari Tervaniemi, 2010 → ...

Christina Krause ,

Supervision of Doctoral Thesis, Christina Krause, 2005, Finland

Supervision of Doctoral Thesis, Christina Krause, 2006, Finland

Kimmo Alho ,

PhD Thesis Supervisor of Anu Kujala, Kimmo Alho, 1997 → 2006, Finland

PhD Thesis Supervisor of Marja-Liisa Kaipio, Kimmo Alho, 1997 → ..., Finland

PhD Thesis Supervisor of Alexander Degerman, Kimmo Alho, 2003 → 2008, Finland

PhD Thesis Supervisor of Virpi Kalakoski, Kimmo Alho, 2003 → 2006, Finland

PhD Thesis Supervisor of Juha Salmitaival (former Salmi), Kimmo Alho, 2004 → 2009, Finland

PhD Thesis Supervisor of Kaisa Kanerva, Kimmo Alho, 2004 → ..., Finland

PhD Thesis Supervisor of Sonja Koistinen, Kimmo Alho, 2006 → ..., Finland

PhD Thesis Supervisor of Emma Salo, Kimmo Alho, 2008 → ..., Finland

PhD Thesis Supervisor of Siiri Kirjavainen, Kimmo Alho, 2009 → ..., Finland

PhD Thesis Supervisor of Laura Sokka, Kimmo Alho, 2010 → ..., Finland

Prizes and awards

Teija Margit Kujala ,

The Philips Nordic Prize for 2007 for achieved and continued research on Neurodevelopmental Disorders (together with R. Näätänen), Teija Margit Kujala, 11.01.2008, Sweden

Risto Näätänen ,

Fellow of the World Innovation Foundation, Risto Näätänen, 2005, United Kingdom

The Honoured Fellow, Risto Näätänen, 2005, Russia

The Senior Prize of the Finnish Psychological Societies and Associations, Risto Näätänen, 2006, Finland

Honorary Doctor of Cognitive Neuroscience, Risto Näätänen, 2007, Spain

Nordic Prize for Research within Neurodevelopmental Disorders (together with T. Kujala), Risto Näätänen, 2007, Sweden

Honorary Doctor, Risto Näätänen, 2008, Russia



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CNC/Kujala

Honorary Doctor, Risto Näätänen, 2010, Finland

The Grand Metal of the University of Tartu, Risto Näätänen, 2010, Estonia

Teppo Särkämö ,

Göttinger Innovationspreis für Praktische Hypertonieforschung, Teppo Särkämö, 20.05.2009

Publication of the Year 2008, Teppo Särkämö, 07.05.2009

Best Poster Award, Teppo Särkämö, 25.11.2010 → 26.11.2010, Finland

Best Poster Award, Teppo Särkämö, 03.12.2010 → 04.12.2010

Rika Takegata ,

Top reviewer award 2007: Biological Psychology, Rika Takegata, 01.04.2008

Ritva Torppa ,

Best Student Paper Award, Ritva Torppa, 05.2010, United States

Christina Krause ,

Most influential Bioelectromagnetics Journal Paper (second place) 2008 by Citation Award by the Bioelectromagnetics Society for the paper: "Effects of Electromagnetic Fields Emitted by Cellular Phones on the EEG During an Auditory Memory Task: A Double Blind Replication Study, published in Bioelectromagnetics, 25, (1), 33-40, January 2004., Christina Krause, 2008

Kimmo Alho ,

Member of the Academia Europaea, Kimmo Alho, 2006 → ...

Knight, First Class, of the Order of White Rose of Finland, Kimmo Alho, 06.12.2009, Finland

Editor of research journal

Risto Näätänen ,

Audiology and Neuro-Otology, Risto Näätänen, 2003 → 2008

Neuroscience Imaging, Risto Näätänen, 2003 → 2010

Clinical Neurophysiology, Risto Näätänen, 2005 → 2009

International Journal of Psychophysiology, Risto Näätänen, 2008

The Behavioral and Brain Sciences Associate, Risto Näätänen, 2008

Kimmo Alho ,

Member, Board of Reviewing Editors, Brain Research, Kimmo Alho, 2006 → ...

Member, Review Editor Board, Frontiers in Human Neuroscience, Kimmo Alho, 2007 → ...

Member, Review Editor Board, Frontiers in Auditory Cognitive Neuroscience, Kimmo Alho, 2010 → ...

Peer review of manuscripts

Elvira Brattico ,

Musicae Scientiae (4 reviews), Elvira Brattico, 2004 → 2011

Cognitive Brain Research (1 review), Elvira Brattico, 10.2005

Brain Research (5 reviews), Elvira Brattico, 2006 → 2010

International Journal of Psychophysiology (1 review), Elvira Brattico, 11.2006

Journal of Cognitive Neuroscience (6 reviews), Elvira Brattico, 2006 → 2009

Psychology Press (1 book), Elvira Brattico, 2007 → 2008

Annals of the New York Academy of Sciences (1 review), Elvira Brattico, 10.2008

Music Perception (4 reviews), Elvira Brattico, 2008 → 2010

Psychophysiology, Elvira Brattico, 01.2008

Brain Research Bulletin (1 review), Elvira Brattico, 03.2009



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CNC/Kujala

Ear and Hearing (1 review), Elvira Brattico, 03.2009
PloSOne (2 reviews), Elvira Brattico, 2009 → 2011
Biological Psychology (2 reviews), Elvira Brattico, 10.2010 → 12.2010
Brain and Behavioral Sciences (1 review), Elvira Brattico, 07.2010
Frontiers in Auditory Cognitive Neuroscience (member of editorial board), Elvira Brattico, 2010 → ...
Human Brain Mapping (1 review), Elvira Brattico, 11.2010

Minna Huotilainen ,

Biological Research for Nursing, Minna Huotilainen, 01.01.2007 → 31.12.2007
Clinical Neurophysiology, Minna Huotilainen, 01.01.2007 → 31.12.2007
Cortex, Minna Huotilainen, 01.01.2007 → 31.12.2007
International Journal of Psychophysiology, Minna Huotilainen, 01.01.2007 → 31.12.2007
Mieli ja aivot, Minna Huotilainen, 01.01.2007 → 31.12.2007
NeuroImage, Minna Huotilainen, 01.01.2007 → 31.12.2007

Teija Margit Kujala ,

International Journal of Psychophysiology, 2002, 2006, 2007, 2010, Teija Margit Kujala, 2002 → 2010
Neuropsychologia, 2002 & 2005, Teija Margit Kujala, 2002 → 2005, United Kingdom
Brain, 2003 & 2008, Teija Margit Kujala, 2003 → 2008
Cognitive Brain Research, 2003-2005, Teija Margit Kujala, 2003 → 2005
Applied Acoustics, Teija Margit Kujala, 2005
Biological Psychology, Teija Margit Kujala, 2005
Cerebral Cortex, 2005 & 2007, Teija Margit Kujala, 2005 → 2007
Clinical Neurophysiology, 2005 & 2007, Teija Margit Kujala, 2005 → 2007
Ear and Hearing, 2005, 2008 & 2009, Teija Margit Kujala, 2005 → 2009
Human Brain Mapping, Teija Margit Kujala, 2005
NeuroImage, Teija Margit Kujala, 2005
Proceedings of the National Academy of Sciences, 2005 & 2008, Teija Margit Kujala, 2005 → 2008, United States
Trends in Cognitive Sciences, Teija Margit Kujala, 2005
Brain Research, 2006 & 2007, Teija Margit Kujala, 2006 → 2007
Journal of Neurolinguistics, Teija Margit Kujala, 19.11.2006
Duodecim, Teija Margit Kujala, 2007, Finland
Journal of Child Psychology and Psychiatry, 2007 & 2008, Teija Margit Kujala, 2007 → 2008
Psychological Bulletin, Teija Margit Kujala, 2007
Frontiers in Neuroscience, Teija Margit Kujala, 2008
Journal for Psychophysiology, Teija Margit Kujala, 2008
Journal of Cognitive Neuroscience, 2008 & 2009, Teija Margit Kujala, 2008 → 2009
TOHOKU Journal of Experimental Medicine, Teija Margit Kujala, 2008
Developmental Science, 2009 & 2010, Teija Margit Kujala, 2009 → 2010
European Journal of Neuroscience, Teija Margit Kujala, 2010
Neuroscience & Biobehavioral Reviews, Teija Margit Kujala, 2010

Risto Näätänen ,

Audiology and Neuro-Otology, 2000-2008, Risto Näätänen, 2000 → 2008, Switzerland



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Brain Research, 2000-2003, 2007-2011, Risto Näätänen, 2000 → 2011, Netherlands
International Journal of Psychophysiology, 2000-2011, Risto Näätänen, 2000 → 2011, United States
Biological Psychiatry, 2001-2011, Risto Näätänen, 2001 → 2011
Cerebral Cortex, 2001, 2004 & 2005, Risto Näätänen, 2001 → 2005, United States
Clinical Neurophysiology, 2001-2011, Risto Näätänen, 2001 → 2011, Ireland
European Journal of Neuroscience, 2001, 2005-2007 & 2010, Risto Näätänen, 2001 → 2010, Germany
Experimental Brain Research, 2001 & 2007, Risto Näätänen, 2001 → 2007, United Kingdom
NeuroReport, 2001, 2007, 2008, 2011, Risto Näätänen, 2001 → 2011, United Kingdom
Neuropsychopharmacology, 2001 & 2007, Risto Näätänen, 2001 → 2007, United States
Progress in Neurobiology, 2001 & 2005, Risto Näätänen, 2001 → 2005, United States
Cognitive Brain Research, 2002, 2003 & 2005, Risto Näätänen, 2002 → 2005, United States
NeuroImage, 2002, 2003, 2007, 2009, Risto Näätänen, 2002 → 2009, United Kingdom
Brain, 2003, 2004, 2006, Risto Näätänen, 2003 → 2006, Finland
Journal of Cognitive Neuroscience, 2004-2011, Risto Näätänen, 2004 → 2011, United States
Journal of Neuroscience, 2004, 2006-2009, Risto Näätänen, 2004 → 2009, United States
Neurobiology of Aging, 2004, 2010 & 2011, Risto Näätänen, 2004 → 08.02.2011
Neuroscience Letters, 2004-2007, Risto Näätänen, 2004 → 2007, United States
Proceedings of the National Academy of Sciences, 2004 & 2007, Risto Näätänen, 2004 → 2007, United States
Psychophysiology, 2004, 2005, 2009 & 2011, Risto Näätänen, 2004 → 2011, United States
BioSystems, Risto Näätänen, 2005, United States
Brain and Cognition, 2005 & 2010, Risto Näätänen, 2005 → 2010
Brain and Language, 2005, 2006, 2009 & 2010, Risto Näätänen, 2005 → 2010, United States
Journal of Personality and Social Psychology, Risto Näätänen, 2005, United States
Behavioral and Brain Functions, Risto Näätänen, 2006, United States
Duodecim, Risto Näätänen, 2006, Finland
Perception and Psychophysics, Risto Näätänen, 2006, United States
Trends in Neurosciences, 2006 & 2007, Risto Näätänen, 2006 → 2007, United Kingdom
Cognition, Risto Näätänen, 2007, United Kingdom
International Journal of Audiology, 2007 & 2008, Risto Näätänen, 2007 → 2008, United Kingdom
Psychological Bulletin, Risto Näätänen, 2007, United States
Rothman Research Institute, Risto Näätänen, 2007, United States
Developmental Medicine and Child Neurology, Risto Näätänen, 2008
Journal of Neural Transmission, Risto Näätänen, 2008
PNAS, Risto Näätänen, 2008
Psychoneuroendocrinology, Risto Näätänen, 2008
Public Library of Science, Risto Näätänen, 2008
Bipolar Disorders, Risto Näätänen, 2009
Developmental Psychobiology, Risto Näätänen, 2009
Neuroscience Research, Risto Näätänen, 2009
Neuroscience, 2009 & 2010, Risto Näätänen, 2009 → 2010
Schizophrenia Bulletin, Risto Näätänen, 2009



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Cephalalgia, Risto Näätänen, 2010
Clinical Neurophysiology, Risto Näätänen, 2010
Journal Of Experimental Psychology: Human Perception & Performance, Risto Näätänen, 2010
Neural Networks, Risto Näätänen, 2010
Neuropsychologia, Risto Näätänen, 2010
Progress in Neuro-Psychopharmacology & Biological Psychiatry, Risto Näätänen, 2010
Schizophrenia Research, Risto Näätänen, 2010

Petri Paavilainen ,

Cognitive Brain Research, Petri Paavilainen, 2005 → ...
Biological Psychology, Petri Paavilainen, 2008 → ...
Brain Research, Petri Paavilainen, 2010 → ...
Psychophysiology, Petri Paavilainen, 2010 → ...

Teppo Särkämö ,

Academic Reviewer, Musiikki-lehti, Teppo Särkämö, 2010 → ...

Rika Takegata ,

Reviewer, Biological Psychology, Rika Takegata, 01.01.2006 → 30.04.2010
Reviewer, Journal of Cognitive Neuroscience, Rika Takegata, 01.12.2008
Reviewer, Neuropsychologia, Rika Takegata, 01.09.2009

Mari Tervaniemi ,

Neurocase, Mari Tervaniemi, 06.2007, United Kingdom
Psychophysiology, Mari Tervaniemi, 08.2007, United States
Brain Research, Mari Tervaniemi, 08.2008, United States
Brain and Cognition, Mari Tervaniemi, 10.2008, United Kingdom
Canadian Journal of Neurological Sciences, Mari Tervaniemi, 01.2008
Ear and Hearing, Mari Tervaniemi, 06.2008, United States
European Journal of Neuroscience, Mari Tervaniemi, 06.2008
Human Brain Mapping, Mari Tervaniemi, 12.2008, United States
International Journal of Psychophysiology, Mari Tervaniemi, 03.2008, United States
Journal of Cognitive Neuroscience, Mari Tervaniemi, 03.2008, United States
Journal of Neuroscience, Mari Tervaniemi, 11.2008
Music Perception (3 reviews: March 2008, May 2008, October 2008), Mari Tervaniemi, 2008, United States
Psychophysiology (2 reviews: May 2008, August 2008), Mari Tervaniemi, 2008, United States
BMC Neuroscience, Mari Tervaniemi, 01.2009
Brain & Cognition, Mari Tervaniemi, 12.2009, United States
Brain Research, Mari Tervaniemi, 11.2009
Cerebral Cortex, Mari Tervaniemi, 12.2009
Clinical Neurophysiology (2 reviews: February 2009, June 2009), Mari Tervaniemi, 2009
European Journal of Neuroscience, Mari Tervaniemi, 01.2009
Hearing Research, Mari Tervaniemi, 11.2009
Human Brain Mapping, Mari Tervaniemi, 10.2009
Journal of Cognitive Neuroscience, Mari Tervaniemi, 05.2009, United States



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Journal of Neuroscience, Mari Tervaniemi, 01.2009, United States
Music Perception (4 reviews), Mari Tervaniemi, 01.2009
Neuropsychologia, Mari Tervaniemi, 09.2009, United States
Neuropsychology, Mari Tervaniemi, 09.2009, United States
Neuroscience, Mari Tervaniemi, 05.2009
Psychophysiology (2 reviews: September 2009, December 2009), Mari Tervaniemi, 2009, United States
Biological Psychology, Mari Tervaniemi, 15.08.2010
Biological Psychology, Mari Tervaniemi, 28.04.2010
Brain Research, Mari Tervaniemi, 01.07.2010
Brain Research Bulletin, Mari Tervaniemi, 10.02.2010
Brain and Cognition, Mari Tervaniemi, 15.09.2010
European Journal of Neuroscience, Mari Tervaniemi, 15.11.2010
European Journal of Neuroscience, Mari Tervaniemi, 20.12.2010
Journal of Cognitive Neuroscience, Mari Tervaniemi, 30.06.2010
Journal of Cognitive Neuroscience, Mari Tervaniemi, 15.11.2010
Journal of Cognitive Neuroscience, Mari Tervaniemi, 20.12.2010
Journal of Neuroscience, Mari Tervaniemi, 15.06.2010
Neuroscience Letters, Mari Tervaniemi, 15.09.2010
Psychology of Music, Mari Tervaniemi, 15.08.2010
Psychophysiology, Mari Tervaniemi, 25.03.2010

Ritva Torppa ,

Serving as a reviewer for the International Journal of Audiology, Ritva Torppa, 04.2010 → 10.2010

Christina Krause ,

Reviewer for Clinical Neurophysiology (and Electroencephalography and Clinical Neurophysiology), Christina Krause, 1998 → 2010
Reviewer for Bioelectromagnetics, Christina Krause, 2003 → 2008
Reviewer for Neuroscience Letters, Christina Krause, 2004 → 2009
Reviewer for Biological Psychology, Christina Krause, 2005 → 2006
Reviewer for Brain Research, Christina Krause, 2005
Reviewer for International Journal of Neuroscience, Christina Krause, 2005
Reviewer for International Journal of Radiation Biology, Christina Krause, 2005 → 2008
Reviewer for Journal of Applied Biobehavioral Research, Christina Krause, 2005
Reviewer for Journal of Applied Biobehavioral Research, Christina Krause, 2005
Reviewer for Puhe ja Kieli, Christina Krause, 2005
Reviewer for Artificial Intelligence in Medicine, Christina Krause, 2006
Reviewer for Brain, Christina Krause, 2006 → 2007
Reviewer for Brain Research Bulletin, Christina Krause, 2006
Reviewer for European Journal of Neuroscience, Christina Krause, 2006 → 2007
Reviewer for Journal of Applied Social Psychology, Christina Krause, 2006
Reviewer for Neuropsychobiology, Christina Krause, 2006
Reviewer for Brain Research, Christina Krause, 2007 → 2008
Reviewer for Neurolmage, Christina Krause, 2007 → 2008



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CNC/Kujala

Reviewer for Nordisk Pedagogik, Christina Krause, 2007

Reviewer for Quarterly Journal of Experimental Psychology, Christina Krause, 2007

Reviewer for the The Power of Media in Education-conference, Centre for Media Pedagogy, University of Lapland, Christina Krause, 13.06.2007 → 15.06.2007

Reviewer for Brain and Cognition, Christina Krause, 2008

Reviewer for Epilepsia, Christina Krause, 2008

Reviewer for Estonian Journal of Engineering, Christina Krause, 2008

Reviewer for International Journal of Psychophysiology, Christina Krause, 2008 → 2009

Reviewer for Progress in Neurobiology, Christina Krause, 2008

Reviewer for Brain, Christina Krause, 2009

Reviewer for NeuroImage, Christina Krause, 2010

Kimmo Alho ,

Reviewer, Clinical Neurophysiology, Kimmo Alho, 1999 → 2006

Reviewer, Psychophysiology, Kimmo Alho, 1999 → 2008, United States

Reviewer, European Journal of Neuroscience, Kimmo Alho, 2003 → 2006

Reviewer, NeuroImage, Kimmo Alho, 2003 → 2007, United States

Reviewer, Brain Research, Kimmo Alho, 2005 → 2009

Reviewer, Experimental Brain Research, Kimmo Alho, 2005 → 2006

Reviewer, Frontiers of Bioscience, Kimmo Alho, 2005

Reviewer, Human Brain Mapping, Kimmo Alho, 2005

Reviewer, Journal of Psychophysiology, Kimmo Alho, 2005 → 2006

Reviewer, Biological Psychology, Kimmo Alho, 2006 → 2010

Reviewer, Cerebral Cortex, Kimmo Alho, 2006

Reviewer, Journal of Cognitive Neuroscience, Kimmo Alho, 2006 → 2009

Reviewer, Journal of Neurolinguistics, Kimmo Alho, 2006

Reviewer, Neuropsychologia, Kimmo Alho, 2006 → 2008, United Kingdom

Reviewer, Scandinavian Journal of Psychology, Kimmo Alho, 2006, Norway

Reviewer, Tieteessä tapahtuu, Kimmo Alho, 2006, Finland

Reviewer, IEEE EMB Magazine, Kimmo Alho, 2006

Reviewer, Neuroscience Letters, Kimmo Alho, 2006, United States

Reviewer, Frontiers in Human Neuroscience, Kimmo Alho, 2007 → 2008

Reviewer, International Journal of Psychophysiology, Kimmo Alho, 2007

Reviewer, Psychological Bulletin, Kimmo Alho, 2007

Reviewer, Cerebral Cortex, Kimmo Alho, 2008 → 2009

Reviewer, International Journal of Psychology, Kimmo Alho, 2008

Reviewer, Hearing Research, Kimmo Alho, 2009 → 2010

Reviewer, Human Brain Mapping, Kimmo Alho, 2009 → 2010

Reviewer, NeuroImage, Kimmo Alho, 2009 → 2010

Reviewer, Brain and Language, Kimmo Alho, 2010

Reviewer, Cerebral Cortex, Kimmo Alho, 2010

Reviewer, Frontiers in Human Neuroscience, Kimmo Alho, 2010

Reviewer, Oxford Handbook of Cognitive Neuroscience, Kimmo Alho, 2010, United Kingdom



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Reviewer, The Journal of Neuroscience, Kimmo Alho, 2010

Teemu Rinne ,

Biological Psychology, Teemu Rinne, 01.01.2005 → 31.12.2005

Cognitive Brain research, Teemu Rinne, 01.01.2005 → 31.12.2005

NeuroImage, Teemu Rinne, 01.01.2005 → 31.12.2005

Brain Research, Teemu Rinne, 01.01.2008 → 31.12.2008

European journal of neuroscience, Teemu Rinne, 01.01.2008 → 31.12.2008

Journal of Neurophysiology, Teemu Rinne, 01.01.2008 → 31.12.2008

Psychological review, Teemu Rinne, 01.01.2008 → 31.12.2008

Psychophysiology, Teemu Rinne, 01.01.2008 → 31.12.2008

Editor of series

Mari Tervaniemi ,

Frontiers in Auditory Cognitive Neuroscience, Mari Tervaniemi, 01.06.2010 → 31.12.2010

Music Perception, Mari Tervaniemi, 01.01.2010 → 31.12.2010, United States

Editor of special theme number

Mari Tervaniemi ,

Cortex, Mari Tervaniemi, 01.01.2010 → 31.12.2010

Assessment of candidates for academic posts

Teija Margit Kujala ,

Assessment of candidates for academic posts: Docentship application of Dr. Annamari Tuulio-Henriksson, Teija Margit Kujala, 2006, Finland

Assessment of candidates for academic posts: Docentship application of Dr. Päivi Helenius, Teija Margit Kujala, 2007, Finland

Evaluation of applications for position as Professor in Cognitive Neuroscience, Teija Margit Kujala, 10.06.2010, Sweden

Risto Näätänen ,

Assessment of candidates for academic posts: Professorship of Neurology application, Risto Näätänen, 2005, United States

Assessment of candidates for academic posts: the position of Reader, Risto Näätänen, 07.02.2005, United Kingdom

Assessment of candidates for academic posts: Associate Adjunct Professorship application, Risto Näätänen, 2006, United States

Assessment of candidates for academic posts: docentship application, Risto Näätänen, 20.03.2006, Finland

Assessment of candidates for academic posts: Postdoc position, Risto Näätänen, 2007, Belgium

Assessment of candidates for academic posts: evaluation of the application for post-doctoral fellowship in the British Academy, Risto Näätänen, 2007, United Kingdom

Assessment of candidates for academic posts: evaluation of candidates for position as Professor in the University of Bergen, Risto Näätänen, 2007, Norway

Assessment of candidates for the position of Professor Research Associate in the University of Cambridge, Risto Näätänen, 2007, United Kingdom

Assessment of candidates for the position of Professor in MIT McGovern Institute For Brain Research, Risto Näätänen, 2007, United States

Assessment of candidates for the position of Professor in University of Bundeswehr, Hamburg, Risto Näätänen, 2007, Germany

Assessment of candidates for the position of Professor in University of Århus, Risto Näätänen, 2007, Denmark

Assessment of candidates for the position of Professor in the Anglia Ruskin University, Risto Näätänen, 2007, United Kingdom

Assessment of candidates for the position of Professor in the University of Bangor, Risto Näätänen, 2007, United Kingdom

Assessment of candidates for the position of Professor in the University of Edinburgh, Risto Näätänen, 2007, United Kingdom



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Assessment of candidates for the post of Programme Leader Track Position in MRC Cognition and Brain Sciences Unit in Cambridge, Risto Näätänen, 2007, United Kingdom

Assessment of candidates for academic posts: Associate Professorship application, Risto Näätänen, 2008, Israel

Assessment of candidates for academic posts: Full Professorship application, Risto Näätänen, 26.02.2008, United States

Assessment of candidates for academic posts: Guest Professorship application, Risto Näätänen, 14.11.2008, Sweden

Assessment of candidates for academic posts: Principal Research Fellowship, Risto Näätänen, 28.11.2008, United Kingdom

Assessment of candidates for academic posts: Professorship application, Risto Näätänen, 2008, Finland

Assessment of candidates for the position of Professor, Risto Näätänen, 03.03.2008, United States

Assessment of candidates for academic posts: Adjunct-Professorship application, Risto Näätänen, 2009, Germany

Assessment of candidates for academic posts: Professorship application, Risto Näätänen, 24.09.2009, Sweden

Assessment of candidates for an academic post, Risto Näätänen, 24.02.2009, Germany

Assessment of candidates for the post of Investigator Scientist, Risto Näätänen, 23.01.2009, United Kingdom

Kimmo Alho ,

Assessment of a candidate to a docent position, University of Turku, Kimmo Alho, 14.03.2005, Finland

Assessment of a candidate to a position of Full Professor, University of Toronto, Kimmo Alho, 2005, Canada

Assessment of a candidate to a position of Associate Professor, University of California at Davis, Kimmo Alho, 2007, United States

Assessment of a candidate to a docent position, University of Turku, Kimmo Alho, 16.04.2008 → 08.05.2008, Finland

Assessment of a candidate to a position of Associate Professor, University of Massachusetts, Kimmo Alho, 2009, United States

Assessment of a candidate to a position of Full Professor, The Hebrew University of Jerusalem, Kimmo Alho, 2010, Israel

Membership or other role in review committee

Elvira Brattico ,

Referee of an application to the Vienna Science & Technology Fund, Elvira Brattico, 01.11.2008 → 30.11.2008, Austria

Teija Margit Kujala ,

Expert member of the National Science Foundation (USA): evaluation of scholarship applications, Teija Margit Kujala, 01.01.2007 → 31.12.2007, United States

Risto Näätänen ,

The International Steering Committee of the Centre of Behavioural and Health Sciences, Estonia, 2002-2008, Risto Näätänen, 2002 → 2008, Estonia

Member of the Scientific Advisory Board of the Bergen Mental Health Research Center, Risto Näätänen, 2005 → ..., Norway

Rika Takegata ,

Reviewer, grant application for Wellcome Trust, Rika Takegata, 11.10.2010 → 10.11.2010, United Kingdom

Kimmo Alho ,

Katholieke Universiteit Leuven, Selection of Centers of Excellence, Kimmo Alho, 24.05.2005 → 25.05.2005, Belgium

European Commission, DG Information Society and Media, Directorate E Digital Content & Cognitive Systems, Kimmo Alho, 16.04.2008 → 06.06.2008, Luxembourg

Membership or other role in research network

Elvira Brattico ,

Vice-secretary, Elvira Brattico, 01.08.2006 → 31.07.2009

Minna Huotilainen ,

Honorary member of Intelligenza, the student organization of Cognitive Science, UH, Minna Huotilainen, 2006 → ..., Finland

Teija Margit Kujala ,

Member of "Language/Literacy Network of Excellence GraphoWORLD" since 2010, Teija Margit Kujala, 29.11.2010, Finland



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Risto Näätänen ,

Member of the Royal Swedish Academy of Sciences, Risto Näätänen, 2008 → ..., Sweden

Miia Silvia Anneli Seppänen ,

Member: Finnish Center of Excellence in Interdisciplinary Music Research, Miia Silvia Anneli Seppänen, 2008 → 2013, Finland

Membership or other role in national/international committee, council, board

Elvira Brattico ,

Board member of Center of Excellence, Elvira Brattico, 01.01.2008 → 31.12.2013, Finland

Board member of CBRU, Elvira Brattico, 01.06.2010 → ..., Finland

Teija Margit Kujala ,

Member of the Management Group of the Cognitive Brain Research Unit, Teija Margit Kujala, 1997 → ..., Finland

Member of the Dean's Collegium of the Faculty of Behavioral Sciences, Teija Margit Kujala, 2002 → ..., Finland

Member of the Governing Council of the Brain Research Society of Finland, Teija Margit Kujala, 21.01.2002 → 31.12.2006, Finland

Deputy Member of the Management Group of the Graduate School of Psychology, Teija Margit Kujala, 01.01.2006 → 31.07.2010, Finland

Deputy Member of the Research Council of the Faculty of Behavioral Sciences, Teija Margit Kujala, 01.08.2006 → 31.12.2009, Finland

Reviewer of a research project grant application for Riksbankens Jubileumfond, Teija Margit Kujala, 08.2006, Sweden

Reviewer of post doctoral grant applications for the University of Helsinki, Teija Margit Kujala, 2006, Finland

Chairman of the Management Group of the Cognitive Brain Research Unit, Teija Margit Kujala, 2007 → ..., Finland

Deputy member of the Management Group of the Department of Psychology, Teija Margit Kujala, 08.08.2007 → 31.12.2008, Finland

Reviewer of a research project grant application for The National Science Foundation (NSF; Linguistic Program), Teija Margit Kujala, 2007, United States

Member of the Management Group of BioMag laboratory, Teija Margit Kujala, 01.01.2008 → 31.12.2011, Finland

Member of the Management Group of the Neuroscience Research Centre, Teija Margit Kujala, 04.05.2008 → ..., Finland

Reviewer of a post doctoral research post for The Turku Institute for Advanced Studies (TIAS), Teija Margit Kujala, 2008, Finland

Member of the Evaluation panel of the Canada Foundation for Innovation (CFI), Teija Margit Kujala, 2009, Canada

Member of the Management Group of the Department of Psychology, Teija Margit Kujala, 01.01.2009 → 31.12.2009, Finland

Reviewer of a research project grant application for The Israel Science Foundation, Focal Initiatives in Research in Science and Technology program, Teija Margit Kujala, 2009

Scientific Expert Member of the Steering Committee of the Computational Sciences research program of the Academy of Finland, Teija Margit Kujala, 2009 → 2010, Finland

Deputy member of the Management Group of the Institute of Behavioral Sciences, Teija Margit Kujala, 01.01.2010 → ..., Finland

Member of the Management Group of the Graduate School of Psychology, Teija Margit Kujala, 01.08.2010 → ..., Finland

Vice Director of Management Group of the Graduate Program of Psychology, Teija Margit Kujala, 01.08.2010 → 07.02.2011

Risto Näätänen ,

Member of the Russian Academy of Sciences, 1994-present, Risto Näätänen, 1994 → ..., Russia

Member of the Governing Board of the Graduate School in Functional Imaging in Medicine, 1995-2007, Risto Näätänen, 1995 → 2007, Finland

Member of the Graduate School of Psychology, Psykonet, Risto Näätänen, 1995 → ..., Finland

Member of the Governing Board of the Helsinki University Central Hospital BioMag Laboratory, 1996-2007, Risto Näätänen, 1996 → 2007, Finland

International Research Center on Neurobiology of Consciousness Light Spot, Moscow, 2001-2008, Risto Näätänen, 2001 → 2008, Russia

Member of the Council of Academia Europaea, 2001-2008, Risto Näätänen, 2001 → 2008, United Kingdom

First Vice President of the International Organization of Psychophysiology (IOP), 2004-present, Risto Näätänen, 2004 → 2005



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Vice Member of the Governing Council of Technomedicum (The Helsinki University Central Hospital), Risto Näätänen, 2004 → 2006, Finland

Teppo Särkämö ,

Doctoral Student Member, Teppo Särkämö, 2007 → 2009, Finland

Mari Tervaniemi ,

National graduate school of Psychology, Mari Tervaniemi, 2003 → 2006, Finland

Expert member at University of Padova, Mari Tervaniemi, 09.2009, Italy

Expert member in French National Research Agency (ANR), Mari Tervaniemi, 02.2009, France

Christina Krause ,

Member of the board of directors in the usability school, Christina Krause, 2002 → 2010, Finland

Member of the department board, Department of Psychology, Christina Krause, 2002 → 2009

Member of the board of directors in the national KIT-network (language technology), Christina Krause, 2003 → 2007, Finland

Member of the Faculty of Behavioural Sciences board, Christina Krause, 2004 → 2006, Finland

The department board, Department of Psychology, University of Helsinki, Christina Krause, 2004 → 2006, Finland

Chairman and member of the organizing board of the Biology of Cognition-seminar, Cognitive Science, University of Helsinki, Christina Krause, 08.04.2005 → 09.04.2005, Finland

Member of the CICERO-network directorate, Christina Krause, 2005 → 2007

Member of the organizing board of the Interdisciplinary Themes in Cognitive Language Research -conference, Christina Krause, 25.10.2005 → 26.10.2005, Finland

Panelist at the LERU-seminar Research Based Teaching in Higher Education, University of Helsinki, Christina Krause, 22.03.2005 → 23.03.2005, Finland

The Neuroscience Research Centre steering board, Christina Krause, 2005 → 2007

Member of the "Opetustoimikunta" [Steering board of teaching] at the Faculty of Behavioural Sciences, University of Helsinki, Christina Krause, 2007 → 2009

Organisation for Health Research and Development (ZonMw, The Hague, The Netherlands), October 2007., Christina Krause, 01.10.2007 → 31.10.2007, Netherlands

Vice-member of the directorate of PsykoNet, Christina Krause, 2007 → 2008

14th World Congress of Psychophysiology of the International Organization of Psychophysiology held in Petersburg in September 8-13 2008., Christina Krause, 01.01.2008 → 31.12.2008, Russia

European Science Foundation pool of experts (2008-2009), Christina Krause, 2008 → 2009

Psykologia 2008 conference, august 20-22, Helsinki, Finland. Invited Symposium "Words, Minds and Memories" (2008)., Christina Krause, 20.08.2008 → 22.08.2008, Finland

Expert position as evaluator of the curriculum of Cognitive Neuroscience at the University of Skövde, Christina Krause, 2009

Member of the "Laadunhallinnan ohjausryhmä" [The "Quality and assessment directorate"] appointed by the rector at the university of Helsinki, Christina Krause, 2009 → 2011

Member of the CICERO-network directorate, Christina Krause, 2009

Member or the "Akateemisen johtamisen asiantuntijaryhmä", appointed by the rector at the University of Helsinki, Christina Krause, 2010 → 2012

Kimmo Alho ,

Director of the Graduate School of Psychology, Kimmo Alho, 01.01.1998 → 31.12.2006, Finland

Chair of the Department of Psychology, Kimmo Alho, 01.08.2001 → 31.12.2006, Finland

Neuroscience Center, University of Helsinki, Board Member, Kimmo Alho, 2003 → 2005, Finland

Faculty of Behavioural Sciences, Member of the Faculty Council, Kimmo Alho, 01.01.2004 → 31.12.2009, Finland

Tursky Award Committee, Society for Psychophysiological Research, Kimmo Alho, 18.10.2004 → 31.12.2005, United States

Cicero Learning Network, Board Member, Kimmo Alho, 01.01.2005 → 31.12.2010, Finland



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Estonian Doctoral School in Behavioural and Health Sciences, Board Member, Kimmo Alho, 01.01.2005 → 31.12.2008, Estonia

Steering Board, Advanced Magnetic Imaging Centre, Helsinki Univ. Technology, Aalto University, Kimmo Alho, 01.01.2005 → 12.12.2010, Finland

Director of the Nordic-Baltic Doctoral Network in Psychology, Kimmo Alho, 08.05.2006 → ..., Finland

Membership or other role in public Finnish or international organization

Risto Näätänen ,

Member of the Deafness Research UK, Risto Näätänen, 18.11.2005, United Kingdom

Member of the Israel Science Foundation, Risto Näätänen, 04.04.2005, Israel

Member of the Old Dominion University Research Foundation, Risto Näätänen, 02.11.2005, United States

Assessment of scholarship applications for Neurologiasäätiö (the Foundation of Neurology), Risto Näätänen, 17.08.2006, Finland

Evaluation of applications for the Winter School of CIMO, Risto Näätänen, 2006 → 2007, Finland

Member of the MRC Grant Review, Risto Näätänen, 24.08.2006, United Kingdom

Member of the RNID -Grant Review, Risto Näätänen, 12.05.2006, United Kingdom

Assessment of scholarship applications for NSF, Risto Näätänen, 2007, United States

Assessment of scholarship applications for Wellcome Trust, London, Risto Näätänen, 2007, United Kingdom

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Israel Science Foundation, Kimmo Alho, 29.04.2008, Israel

Director, CICERO Learning Network, Kimmo Alho, 01.08.2009 → 31.12.2010, Finland

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Elvira Brattico ,

Interview in Vuosikertomus 2006 Käyttätymistieteellinen Tiedekunta, Elvira Brattico, 2006, Finland

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Musicality via vaccination?, Mari Tervaniemi, 06.2006, Finland
Subcortical cognition, Mari Tervaniemi, 11.2006, Finland
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Music acts as drugs for your brain, Mari Tervaniemi, 03.2008, Finland
Music is tuning your brain, Mari Tervaniemi, 04.2008
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Music for our brain, Mari Tervaniemi, 03.2010, Finland

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E-learning conference, Helsinki, Christina Krause, 11.10.2005, Finland

Interview for written media: Aivot ja ihmisen rajallisuus, Christina Krause, 26.10.2005, Finland

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KVIT-2007 symposium on Cognitive Science, Christina Krause, 01.10.2007, Finland

Symposium, CICERO-network, University of Helsinki., Christina Krause, 30.03.2007, Finland

University of Art and Design Helsinki, Christina Krause, 19.03.2007, Finland

Chairman at the "Psykologia 2008" conference, august 20-22, Helsinki, Finland. (2008)., Christina Krause, 2008, Finland

Interview for Hufvudstadsbladet, Christina Krause, 28.01.2008, Finland

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Kimmo Alho ,

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Sunnuntaisuomalainen, Tyhmä kysymys -palsta, Kimmo Alho, 01.11.2009, Finland

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Yliopistolainen 4/2009, Kimmo Alho, 28.04.2009, Finland

Participation in radio programme

Minna Huotilainen ,

YLE Radio 1: haastattelu Minna Huotilainen, Minna Huotilainen, 18.11.2005

YLE X haastattelu, Minna Huotilainen, 01.11.2006

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Teija Margit Kujala ,

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Radio interview: BBC Radio Scotland / Morning Extra, UK, Teppo Särkämö, 20.02.2008, United Kingdom
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Radio interview: National Public Radio / Studio 360, USA, Teppo Särkämö, 25.08.2008, United States
Radio interview: Swedish Radio / Sisuradio, Sweden, Teppo Särkämö, 25.02.2008, Sweden
Radio interview: YLE Radio 1 / Kulttuurisuutiset, Finland, Teppo Särkämö, 20.02.2008, Finland
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Mari Tervaniemi ,

Discussion based on Sacks' book Musicophilia, Mari Tervaniemi, 04.2008, Finland
About the importance of silence, Mari Tervaniemi, 03.2010, Finland
What's the meaning of music for a listener, Mari Tervaniemi, 11.2010, Finland

Christina Krause ,

Participation in radio programme: YLE, Christina Krause, 2006, Finland
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Participation in radio programme: YLE, Radio Extrem, Christina Krause, 28.02.2007, Finland

Kimmo Alho ,

Radiohaastattelu, "Reseptori"-ohjelma, Kimmo Alho, 24.06.2010, Finland

Participation in TV programme

Minna Huotilainen ,

Akuutti TV2 Sikiö oppii, Minna Huotilainen, 18.03.2008
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Teija Margit Kujala ,

Participation in TV programme: TV1, Tieteessä tapahtuu, Teija Margit Kujala, 05.05.2005, Finland
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Risto Näätänen ,

Participation in TV programme: YLE Areena, TV2, Risto Näätänen, 09.10.2008, Finland

Teppo Särkämö ,

TV appearance: YLE Kulttuurikuntoklinikka, Finland, Teppo Särkämö, 11.12.2008, Finland
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Brain research as a methodological boost for music studies, Mari Tervaniemi, 11.2007, Finland
Ohjelma Luovuus ja hulluus sarjassa Tutkiva juttu, Teema-kanavalla, Mari Tervaniemi, 12.2007, Finland
What is special in musicians, Mari Tervaniemi, 11.2008, Finland

Ritva Torppa ,

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"Tutkiva juttu: Ääntä kohti", YLE Teema, Kimmo Alho, 01.01.2008, Finland

Prisma Studio, TV1, Kimmo Alho, 11.03.2009, Finland

Participation in interview for web based media

Minna Huotilainen ,

Cordis newsletter interview of Minna Huotilainen, Minna Huotilainen, 01.09.2006

haastattelu Helsingin yliopiston verkkouutisissa, Minna Huotilainen, 01.01.2007

Teija Margit Kujala ,

Participation in interview for web based media: Helsingin yliopiston uutisarkisto, Teija Margit Kujala, 19.09.2007, Finland

Participation in interview for web based media: YLE TV News, Teija Margit Kujala, 19.09.2007, Finland

Teppo Särkämö ,

Web article interview: Los Angeles Times, USA, Teppo Särkämö, 25.02.2008, United States

Web news interview: AFP, France, Teppo Särkämö, 19.02.2008, France

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Web news interview: Reuters, UK, Teppo Särkämö, 20.02.2010, United Kingdom



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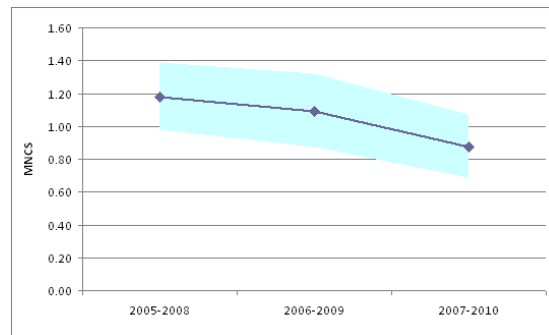
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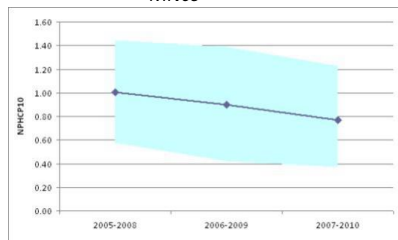
Basic statistics

Number of publications (P)	199
Number of citations (TCS)	1,644
Number of citations per publication (MCS)	8.26
Percentage of uncited publications	24%
Field-normalized number of citations per publication (MNCS)	.96
Field-normalized average journal impact (MNJS)	1.11
Field-normalized proportion highly cited publications (top 10%)	.79
Internal coverage	.86

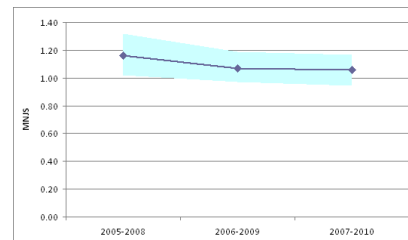
Trend analyses



MNCS

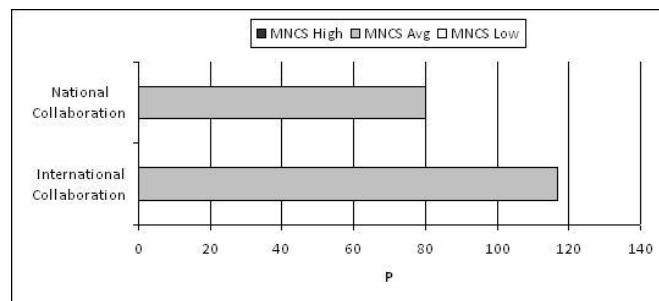


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MNJS

Collaboration



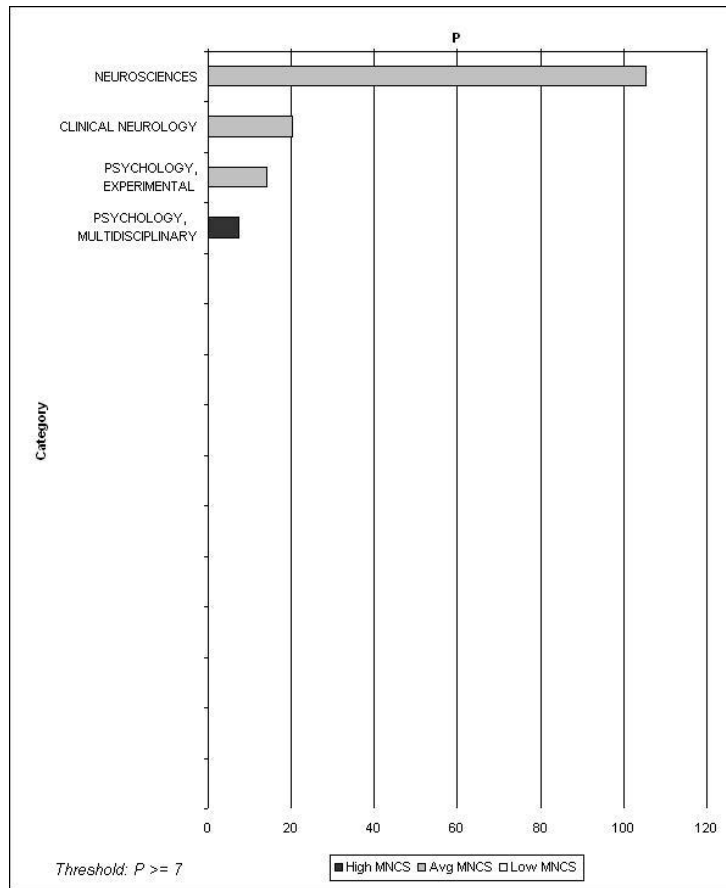
Performance (MNCS) by collaboration type



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